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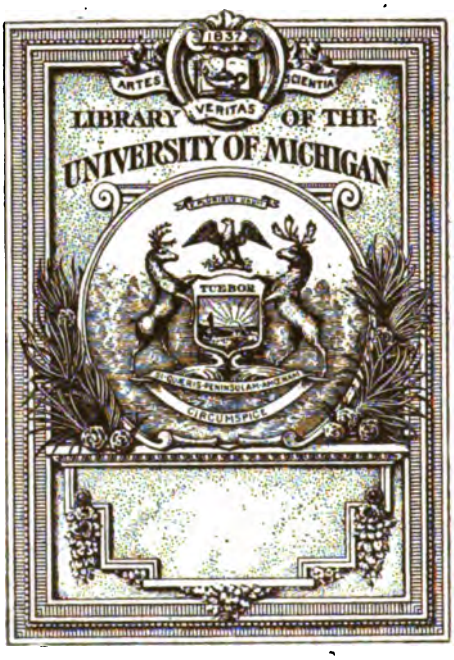

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THE MEDICAL INTERPRETER

A DIGEST IN FOUR NUMBERS

The Interpretation and Translation of the World's Practical Medicine and Surgery—*Illustrated.*

DOMESTIC AND FOREIGN

SELECTED PRACTICAL FOREIGN MEDICAL AND SURGICAL LITERATURE

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ABSTRACT ARTICLES FROM UNITED STATES BUREAUS OF MEDICAL RESEARCH AND COMMERCIAL RESEARCH BUREAUS OF PRACTICAL TECHNIQUE OF SERUMS, VACCINES AND PRACTICAL DIAGNOSTIC TESTS

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TO

The American Medical Association

AND

The Southern Medical Association

THIS PUBLICATION IS DEDICATED AS A TRIBUTE TO THEIR HIGH PROFESSIONAL IDEALS AND CONSTRUCTIVE LABORS IN BEHALF OF THE MEDICAL PROFESSION AT LARGE.

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FOREWORD

THERE is no lack of medical publications in the United States. This country has relatively more medical periodicals than any other country. It would therefore appear that to add a new medical publication is hardly justified. But it is not the intention of the Medical Interpreter to compete with its numerous contemporaries. Its purpose is quite different from that of the other medical periodicals. Just because the medical literature of our day is so extensive it was considered a valuable undertaking to establish a publication which would select from the great bulk of medical literature the most valuable portion and present it to the medical practitioner in a condensed form. The general practitioner has not the time to keep up with the bulky modern literature and to read the numerous medical periodicals. To most of them the foreign medical journals are not accessible and if they were many of the physicians are not familiar with the modern languages. The study of languages is not pursued in this country as it is in Europe and for a very good reason. As the European nationalities, almost every one with a different language, are crowded together in a smaller territory than that of the United States, they are compelled to study languages in order to keep up intercourse with their neighbors. Here in the United States we have fortunately only one language. The stimulus for language study is lacking and the valuable time the student would have to devote to the many languages can profitably be applied to more practical work.

Up to the present day the European nations have been leading in most fields of scientific activity and to a great extent also in medicine. But the great war has weakened them so much that they will be unable to maintain the rate of progress which forms such an illustrious page in the history of civilization of the past fifty years. There

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is only one country that can take up this burden. The United States, young, vigorous and full of energy, must take up the sinking standard and carry it forward to further conquests. But to enable the medical men of this country to accomplish this task they must be acquainted with the work of the older countries. The Medical Interpreter proposes to undertake this work. From the great mass of medical literature it will select only what is of permanent value. It will bring abstracts only of articles that have something new to say, that mark a progress in medicine. It is assumed that the American physicians are fairly well acquainted with the current literature of this country. We shall therefore pay more attention to the literature of Great Britain and the other countries of Europe. In the arrangement it was first intended to make two separate divisions, one for medicine and one for surgery. But after mature deliberation it was deemed best to form one continuous alphabet, but to place the titles, or key words, of medicine on the right and those of surgery on the left. This gives us the advantage of separating the two divisions without sacrificing unity. Any subject can thus be more readily found than by dividing the whole into two divisions, each set apart from the other. To enhance the value of the publication an article of practical import by a leading medical authority will stand at the head of each number.

ALBERT ALLEMANN, M.D.
Washington, D. C.

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INTRODUCTION

THE object of the Medical Interpreter is to present to the medical profession a medical digest in four numbers annually, that will give an interpretation and translation of foreign and American literature of the world's practical medicine and surgery. These numbers will present in themselves an evolution in the method of furnishing medical and surgical information in such a concise, logical and rapid way, that the very latest accepted facts, attitudes and ideals in diagnosis, prognosis and treatment may be instantly applied by the physician at sick bed to the case at hand.

Time and time again does the every-day busy practitioner realize the importance and value of keeping abreast of the times, therefore the potential motive of these numbers is to lessen the great difficulties met with in the study of medical sciences.

We all know from experience how much time is wasted with voluminous publications and the many periodicals that go to waste on the physicians' shelves not knowing what articles to discriminate, from those that would be really practical to read. Aside from the fact the articles are usually long and forbidding to the physician who must take a few minutes for study between calls. Again many of the most recent achievements and attitudes in medicine appear in foreign literature, that we cannot even read.

With the Medical Interpreter tne busy doctor is able to meet this great need. The plan adopted by the Medical Interpreter is not only a very simple one, but a very practical one. The plan first is to abstract from all the National and Commercial Research Bureaus, also epitomize, correlate from an anthological point of view the advancements, achievements and recent ideals and attitudes of the practical

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literature that can be registered in the Surgeon General's Index at Washington, Rockefeller Institute, Carnegie Library and all the National Libraries of the world.

Many articles will appear abstracted by authorities and authors of the original article that have appeared in foreign and American literature, thus giving the writer and the article time and opportunity for careful examination to describe the best methods and views as seem to have ample justification. By this method discrimination becomes practical as soon as investigations show the value of the previously questioned view or attitude.

The reader can then build up a practical conception underlying the advances of today. With his clinical experience the physician at sick bed can find indications of procedure which may enable him to favorably modify the evolution of the disease.

The publishers earnestly hope to have succeeded in demonstrating through these numbers that it is easy for the busy doctor to keep up with the rapid changes, ideals and attitudes in medicine and surgery by this simple means within the reach of all.

The publishers cannot express too adequately their gratitude for the efforts of their distinguished Editor-in-Chief, Dr. Albert Allemann of Washington, D. C. Without his efforts this work could never have appeared.

In response to the demand for practical post-graduate information the Editorial Staff has selected Dr. George S. Bel of Tulane University, New Orleans, La.. as Associate and Editor-in-Chief of Post-Graduate Medicine.

Dr. Bel stands today among the undisputed medical authorities of the widest reputation on this continent, with duties that are actual, and is one of the strongest editors and teachers associated with any medical publication.

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THE MEDICAL INTERPRETER

The real advances made in the practice of medicine including new and essential facts in diagnosis, prognosis and treatment which underlie a wide successful practice and post-graduate teacher will appear in the introductory pages of each number of the Interpreter, concisely filling the place attempted by voluminous publications.

These articles will become at once, short and concise encyclopedic lectures for future reference with a view of embracing in a short time the very latest ideals and attitudes in medicine that are being advanced throughout this continent.

The cream of practical procedure, the most recent opinions and attitudes from actual clinics will be illustrated by bedside teaching, in a concise continued course of short and practical lectures.

Thus with the introductions of each number a post-graduate course is furnished that will be practical with a minimum expenditure of time in study, practically bringing the clinics to the physician's desk.

Also to our Advisory and Southern Editor-in-Chief, Dr. Geo. M. Niles, noted specialist and author whose literature is now being searched in all the medical centers of the world. This masterly and modest writer as a rule has avoided oratorical discussions and abstracted only those results which appeared to be final. He has also excluded doubtful hypotheses.

Demonstrated theories and well established facts become independent of those investigators who have made them known. In proportion as science is brought to perfection it becomes impersonal; hence he has to a great extent been able to ignore citations of proper names, confining himself to final achievements: mentioning only those authorities and authors who have made some important discovery, advanced some practical theory and recorded some attitude of consequence. Although on many occasions he has mentioned researches

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pursued by himself, he has reported them just as he would those of other authorities without indicating their origin. This appears to us to be the best way to avoid the questions so often raised by claims of priority in publications of this kind. The publishers also wish to express their thanks to the various Medical Departments at Washington for the courtesy of Surgeon-General Ireland and General Noble and particularly to Colonel Garrison, in this department, for his personal abstracts and literature of practical medicine and surgery.

We also wish to express our gratitude to the U. S. Bureau of Research Department, under General Rupert Blue, the physicians, laboratory workers and employes for their faithful co-operative work with us in every possible way. Through this department and no other source could this information be obtained in America, and the right of publication has been given us.

In conclusion we have to acknowledge our great indebtedness to all librarians and editors who have so generously co-operated with us in this work.

THE PUBLISHERS

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Introductory Post-Graduate Lectures

By Dr. Geo. S. Bel, of Tulane

BACILLARY DYSENTERY

THE name "dysentery" is primarily a clinical term, and one applied to a variety of conditions of the intestinal tract. Any and all pathological states of the bowel that have as a concomitant symptom, diarrhea, are, clinically speaking, dysenteries.

However, the term "dysentery" is applied nowadays only to certain specific infections of the large intestines. Acute dysentery invariably refers to the bacillary produced disease, and chronic dysentery to the protozoan infection (Entameba histolytica). They are also further differentiated clinically by calling one acute bacillary and the other chronic tropical dysentery.

We shall only consider here, however, the dysentery that has for its causal excitant the specific micro-organism known as B. dysenteriae, Shiga. This will include, of course, the "infantile diarrhea" or Summer complaint in children since it has been definitely established that these have the same etiology (Duval).

Bacillary dysentery is an acute infectious disease caused by the specific bacillus discovered by Shiga in 1898, and characterized by an acute inflammation of the intestine. The infection may be divided into the epidemic form, which is caused by the true Shiga bacillus, and the sporadic or endemic type, which is due to other different strains of the dysentery bacillus species, the so-called para-dysentery variants.

Whereas clinically we recognize only the acute form of the infection, etiologically we have to consider four types of the disease,

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namely, that due to the Shiga, Flexner, Hiss and Duval types of bacilli respectively.

In this connection it should be mentioned, however, that each presents the same clinical and pathological picture. The determination of the type of infection in the various forms of acute bacillary dysentery has an important bearing upon serum or vaccine therapy; as much significance, therefore, should be attached here to strains as for the infections Lobar pneumonia and epidemic meningitis.

The essential lesion of bacillary dysentery is in the intestinal tract, primarily at the flexures of the large bowel. Only in severe cases do we find the disease process extending into the ileum. Occasionally in children the lesions extend throughout the whole of the small intestines.

In general the mucous membrane of the gut is hyperemic, edematous, and covered with a diphtheritic membrane. Usually there is an absence of fibrinous exudate, the mucosa showing merely discrete, shallow ulcers. Fatal hemorrhage is exceedingly rare and perforation of the bowel with peritonitis is almost unknown in bacillary dysentery.

Extra-intestinal lesions in acute dysentery occur only as a result of the absorption of specific toxin. These are always of a degenerative character and effect the truly functional elements of the various internal organs, more especially the liver, spleen, heart and kidneys. The infection, unlike typhoid, is never a septicemia, the specific bacilli remaining throughout the course of the disease at the site of the initial lesions (intestine).

Multiple, small abscesses of the liver are occasionally found in bacillary dysentery, but the specific micro-organism is not thought responsible. Bacteria of the normal intestinal flora are alone found

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in the liver lesions, and presumably have reached this situation via the portal circulation.

Epidemics of bacillary dysentery have occurred throughout the tropics and temperate zones. Small circumscribed epidemics occur among infants in the congested districts of all large cities. Endemic dysentery is common for asylums and public institutions. We have come to regard indigenous dysentery as of far more importance nowadays than the epidemic form. Bacillary dysentery like cholera, typhoid, etc., is water-born; therefore it may be said that wherever the water supply is polluted with human excreta, it is endemic and may at times become epidemic. Almost all epidemics of dysentery are the results of a too intimate connection between sewerage disposal and water supply. Polluted well water is a common source of infection in rural districts. Dairy products and other food stuffs may at times be the source of infection. Milk has frequently been the cause of some of our very severe epidemics. This is an important factor in the spread of so-called infantile diarrhea, which is caused by one of the bacilli of the dysentery group. Infection takes place by ingestion of the specific bacilli with water or food contaminated from the stools of dysentery patients. At the present time epidemics are infrequent compared with the days before modern sanitation.

Individuals who have recovered from bacillary dysentery may harbor for a long time the specific organism in some part of the intestinal tract. Such persons are to be regarded as "carriers" and are entirely analogous to those for typhoid and para-typhoid fevers. The mortality of acute dysentery epidemics varies from five to twenty per cent.

The disease commonly begins as an acute cholitis which is ushered in suddenly by abdominal pain, tenesmus and diarrhea. As

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the infection progresses or becomes more severe the pains and diarrhea increase, the stools lose their fecal character, becoming small in quantity and containing much mucus, which is often streaked with blood. At this stage the tenesmus is very severe. At the height of the disease the patient may have from ten to thirty stools a day.

Bacillary dysentery is disseminated by people who have practically or completely recovered from the infection and discharge the specific micro-organisms in the stool. The bacilli are distributed in this manner to drinking water, food, etc., by direct and indirect contact, by flies, dust particles, etc. The unsanitary mode of life in the tropics and in our large cities favors the dissemination of the specific agent.

As already stated the disease is an infection of the colon, characterized by hyperemia and ulceration of the mucosa, which produces an abnormal secretion of mucoid material. Due to the presence of the ulcers, there is excited a most violent diarrhea with tenesmus, and the passage of much blood-tinged mucus. So frequent is the passage of stools and so violent the continued straining that the patient becomes exhausted. Nausea and vomiting are common at the height of the infection. The skin is covered with perspiration, the voice is hoarse, eyes sunken, and the patient presenting as a whole, the condition noted for cholera. If the attack is not fatal there may be relapses with the disease settling into a chronic form.

In the absence of symptoms referable to other organs than the intestinal tract the diagnosis of bacillary dysentery can only be made by bacteriological examination. In this connection it may be stated that the blood of dysentery patients contains a sufficient quantity of specific agglutinins after the first week of the disease to diagnose the condition by means of the agglutination reaction. This test has the same significance in bacillary dysentery as the widal has in typhoid.

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BACILLARY DYSENTERY

The treatment of bacillary dysentery is the same for all forms whether epidemic, sporadic or endemic, since the symptomatology and course of the disease does not differ in any essential. At the outset it is to be remembered that we have to deal with two consecutive conditions, namely, the specific acute infectious process and the sequelae. The first condition, which is the infection proper, is treated by the use of specific biological products (antitoxin, vaccine). Passive immunization is most effective in the epidemic form of the disease, and where a monovalent "Shiga" serum is administered the patients thus treated show a distinct benefit, and there is a marked decrease in the mortality by the use of this immune serum.

In the endemic form of bacillary dysentery the serum has not been so promising, especially in the type known as infantile diarrhea. The beneficial results are only obtained in the acute attacks where there are symptoms of severe toxemia. On the other hand, in cases where the powers of resistance have been lowered and the nutrition impaired, serum therapy is of no avail. In these cases the symptoms are in large part due to secondary infections and to impaired digestion rather than to the specific toxemia, which might explain the failure of specific serum.

Vaccination as a curative agent for bacillary dysentery has not proven efficacious. It is more reasonable to employ a vaccine as a prophylactic or preventative, and when employed this vaccine should contain all the important members of the group of dysentery excitants (polyvalent antigen).

In the treatment of the sequelae nursing is of prime importance, not only to the patient but to his immediate environment and to the community at large. Absolute rest in bed is necessary in all cases, for physical exertion otherwise incidental to the numerous bowel

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movements add to the prostration caused by the toxemia. In the beginning there should be a total abstinence from all food that leaves a residue. It may be said that this part of the treatment does not differ from that of typhoid infection. The administration of water is of the greatest importance and particularly in the acute stage of the disease, since there is more or less dehydration of the tissues caused by the frequent bowel evacuation. After the symptoms become ameliorate, it will be permissible to use diluted pasteurized milk. Not until the patient has entirely recovered and has been without symptoms for a week should we venture to give food such as cereals, eggs, meat, etc. The return to the normal diet should be slow.

As to drugs it is impossible to think of any one which could be used with impunity to check the diarrhea. Astringents and opiates are contra-indicated. The lower bowel at first may be thoroughly cleansed by purgation, using for this purpose castor oil. During the course of the disease daily colonic flushing with salt solution should be carried out. Hydrotherapy in the form of sponging and ice-cap to the head is advocated when the fever is high and the headache severe.

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PNEUMONITIS—(PNEUMONIA)

This article on Pneumonitis by Dr. Geo. S. Bel, Professor of Theory and Practice of Medicine and Clinical Medicine, Tulane University, is based on new and advanced attitudes on the pneumonias, and has been registered in a class to itself, and the physician will not find any such article or explanation in any medical literature old or new. The article covering the treatment of this subject will appear in The Medical Interpreter No. 2.

Pneumonitis is an acute infectious disease of the lungs characterized by consolidation the result of inflammatory exudate in the tissues, and caused by a variety of pathogenic micro-organisms. Anatomically, we recognize two forms of inflammation of the lungs, which are determined according to whether the pathologic process has to do primarily with the terminal air-sacs of a lobe or with a bronchus.

It is essential in every pneumonia to determine which one of these processes we are dealing with, since it has a direct bearing on the etiology and thus subsequently on the treatment. It is well recognized nowadays that the type of pneumonia called the lobar or croupous is only caused by some one of the strains of the pneumococcus; while the other form of pneumonia, namely broncho or lobular, has a variety of exciting agents.

In this connection bronchopneumonia is a type of lesion produced by tuberculous, influenzal, streptococcal, typhoidal, meningococcal, bubonic, etc., infections of the lungs. With the exception of the pneumococcal infection of the pulmonic tissue the injury invariably begins in connection with the terminal bronchial twigs.

The pneumococcal infection, on the other hand, never shows the focus of injury in the bronchial tree. Whether the infection is lobar or broncho-pneumonia the excitant enters by way of the respiratory

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tract, namely the invasion is bronchogenic and not hemotogenous, as was formerly thought to be the case, particularly for the lobar type.

Lobar pneumonia, which is produced by one of the several variants of pneumococcus species, invariably has a sudden abrupt onset, with more or less fever, chill, pain, and symptoms of toxemia. The lung is found to have involved at least a lobe. In other words, there is a large focus of infection which is in marked contrast to a small focus or foci, characteristic of the other form of pneumonia.

A physical examination early in this infection reveals that a large portion of the lung is involved, which is never the case in the early part of the broncho type of the disease. Of course, it must be recognized that bronchopneumonia which is rapidly advancing and has been under way for some time may give you the same amount of lung involvement as is seen in lobar pneumonia.

It is this very point that I wish to stress, since I believe that too often a bronchopneumonia is mistaken by the clinician from the physical signs for the lobar type. This is especially true of the so-called deep-seated central lobar pneumonias, which, in reality, are broncho in type, borne out by careful and painstaking autopsy study.

Furthermore, it is a matter of clinical as well as pathologic knowledge that lobar pneumonia is a simultaneous involvement of a whole lobe or lobes, while in bronchopneumonia this is never the case. On the contrary, the bronchopneumonia begins insidiously as a deep-seated bronchitis with subsequently the slow development of small contiguous areas of consolidation. There may be and there often are multiple foci of infection in bronchopneumonia, which in part account for the patchy nature of the consolidation, while in lobar pneumonia there is always one large focus.

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As to the inflammation, there is no essential difference in the exudate of either pneumonia. They are both acute, and may be characterized by serous, purulent, or fibrinous accumulations.

There is this difference, however, that in the one, namely lobar, the exudate is confined to the terminals of the respiratory tree, it having begun and ended here; in bronchopneumonia the exudate is not only in the terminal air-sacs of one or more systems, but it is in the interstitial tissues, such as the peribronchial and interalveolar structures, and in every instance begins in the lining of the bronchial tree.

The areas of consolidation are secondary to the primary bronchitis, having developed subsequently as an extension from the original focus. In this fact we have an explanation of the development from time to time in the course of bronchopneumonia of new isolated foci of consolidation.

In other words, a new crop of lesions may appear from time to time during the course of the infection. These new foci are always at first small and scarcely to be detected, but if carefully followed will be found to gradually increase in size. As time goes on these bronchopneumonic foci may attain such a size as to meet or coalesce, giving us practically a whole lobe involvement. If the case is seen at this period of the disease it is readily understood how the clinician may wrongly call it one of lobar infection.

However, if you bear in mind what I just said you may avoid confusing the bronchopneumonia with the lobar pneumonia; as in the former, even though the whole lobe is practically solid, you will detect on careful physical examination a variety of signs indicating that the inflammatory process is of various stages, though we do not recognize in bronchopneumonia the gross pathologic stages of lobar pneumonia, such as engorgement, red and gray hepatization.

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It is well to remember in uncomplicated lobar pneumonia the lung tissue after convalescence has returned to normal; while in bronchopneumonia the lung, at best, is only partially normalized. This is because in the one the inflammatory process did not involve the supporting tissue of the lungs, and in consequence resolved without organization; while in the broncho type the inflammatory process involved the supporting tissues and, of necessity, is organized during repair.

To state in other words, recovery after lobar pneumonia leaves the lung in an uncomplicated case, anatomically and physiologically, as it was before the infection; in bronchopneumonia the lung is in these respects invariably impaired.

The importance of this is obvious. For example, a lung thus permanently impaired, even though slightly, renders it vulnerable to other infections, more especially tuberculosis. In children this is particularly the case where bronchopneumonia is followed by pulmonary tuberculosis.

To appreciate the pathology of bronchopneumonia one must go over the physical signs from day to day, for in no other way can you perceive that the inflammation is spreading insidiously by continuity and contiguity. All of this is in marked contrast to the development of the process of lobar pneumonia.

We notice scattered areas of impaired resonance, with alternating hyper-resonance, also detect subcrepitant rales occasionally, but the predominating rale is the piping dry type which outsounds the other in loudness. This kaleidoscopic change is only appreciated by an understanding of the pathology.

Just as we have changes from day to day in the size of the consolidation, so have we changes in the consistence of these areas which

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explains why an area resonant yesterday may be dull today, and why these rales also vary in position and in character. The loud, wheezing rales in bronchopneumonia are due to the inflammation of the bronchioles, which is a primary and continuous process of this disease.

To explain the symptoms and signs in pneumonias we must bear in mind the anatomy, physiology, and pathology of the organ involved. While we here are concerned mainly with the pathology, we cannot understand this unless we know the anatomy and physiology; the three are essential if you are to appreciate the signs and symptoms of pneumonitis.

Students and practitioners of medicine must have an explanation of the various manifestations on the part of the host who is combating an injurious agent if they are to intelligently diagnose and subsequently treat the disease. Too often the student learns a group of signs and symptoms for a given infection without understanding their mechanism of production, and for this reason I will now attempt to elucidate the symptom-complex occasioned by infection of the lungs.

The temperature is occasioned by what? In a general way we say that all infectious diseases give us increased body heat, which is true; but this does not explain the mechanism of production. We believe it is the result in part of the direct action upon the body cells by the poison elaborated by the causal agent.

This action of the poison upon the cells increases their activity and thereby causes more heat production. There is also a direct stimulation by the poison upon the heat-producing centers which is not commensurate with heat dissipation.

We know the pulse-rate or heart action and respiration are increased in pneumonias. Why? The explanation of the cause is

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rather complex. Three factors at least are concerned. In general we may say the specific poison is directly or indirectly responsible. The poison produces pyrexia in the manner previously mentioned, and this fever accelerates the heart because of the increased body heat.

Second, the poison is thought to have a depressing effect upon the inhibitory cardiac fibers of the vagus, which permits, in consequence, an acceleration of the heart action. Third, is the direct action upon the parenchyma of the heart by the poison which brings about weakening of the heart muscle because of the degeneration.

This lowers the blood pressure; and the heart, to compensate, beats faster. Furthermore, the lowering of the blood pressure means less oxygenation. There is one thing I wish to call your special attention to, and that is, that the consolidation of the lung is in no way responsible for the increased heart action, the dilatation of the right chambers, or the dyspnea.

If the solid lung was the cause of these symptoms, how do we explain the rapid return to normal of the heart, its action, and the dyspnea immediately following the crisis, when we know that there are several days during the resolution stage in which the lung is still solid, as demonstrated upon physical examination?

The herpes is thought to be the result of irritation and stimulation of some one of the posterior root ganglia.

The pain which is so common and constant with lobar pneumonia is due to the inflammatory process involving the pleura. The pain is the expression of irritation of the nerve-endings by the toxin, more so, we think, than we formerly thought, to the pressure or stretching of the nerve-endings by the surrounding exudate.

In this connection let me impress the fact that lobar pneumonia is always associated with pleurisy, differing in this respect from

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the broncho type except in those cases, and as a rule, few in number, where the inflammatory process begins at the periphery or extends to the periphery. It may be said that no bronchopneumonia begins with an acute pleurisy, because even with those cases where the focus began at the outer margin the inflammation was not exactly in the pleural surface, but some distance below.

Not infrequently the pain in lobar pneumonia is misleading, since it may be located in parts far removed from the seat of inflammation. This is often spoken of as referred pain; for example, the patient may only have a pain in the abdomen and this might be mistaken for gall bladder disease and appendicitis. Particularly is this true in children.

Regarding the sputum in the early stage in the lobar type, it is likely to be scant and of a mucoid nature. Later it becomes more profuse, blood streaked, thick and tenacious, and rusty colored. In bronchopneumonia the expectoration is commonly mucopurulent, and not so likely to be blood stained, and rarely rusty. This difference in the sputa in the two pneumonias is readily explained by the pathology.

In lobar pneumonia the sputum is composed largely of the hypersecretion from the respiratory tubes, while in bronchopneumonia it is the actual inflammatory exudate mixed with the hypersecretion. The sputum in lobar pneumonia is thick and tenacious because of the mucus predomination, and later on in the disease when it becomes creamy it loses its tenacity because of the preponderance of inflammatory exudate which has undergone more or less digestion. The rusty color of the sputum is due to the extravasated blood which has hemolized.

The blood picture in lobar pneumonia does not differ materially from bronchopneumonia or, for that matter, from that of any other pyogenic infection. It is the rule to have a very high neutrophilic

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leukocytosis in lobar pneumonia for the reason that there is a tremendous focus of acute inflammation which drains a large vascular area of the essential cells of acute inflammation.

Without exception lobar pneumonia is the largest acute inflammatory area that we know for any infection. In explanation of the occurrence of leukocytosis we believe that it is the replenishing of the normal neutrophilic element to the circulation by the blood-making tissue in lieu of the loss occasioned by the tissues inflamed. The local attraction or positive chemiotaxis of the leukocyte is enormous in lobar pneumonia because of the size of the lung area involved, together with the fact that there is a large number of blood vessels that are normally present of necessity in the lung. The drain on the vascular system through the vessels involved is so large there must be a compensatory replenishment of the neutrophils to the circulation.

It might be asked, Why the need on the part of the host for an increase above the normal leukocyte in the circulation during lobar pneumonia infection? I believe there is no need, but in accordance with Weigert's law of superproduction we have the true explanation of the circulatory leukocytosis.

The blood making tissues are called upon to make up the loss in neutrophils which have been attracted from the vessels to the inflammatory focus; and in making up the loss the tissues overdo it, just as we have in the case of repair to an injury or the production of antibodies. It is well to remember occasionally we may have in lobar pneumonia a low leukocytosis or even a leukopenia, which signified in both instances a low-grade resistance on the part of the patient and necessarily a poor prognosis.

In explanation of certain physical signs that are present in pneumonia I wish to say they are in general, brought about by the non-

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functionating solid lung tissue. The lagging or immobility of the affected side is the result of pain from the pleuritis and the consolidative pulmonic tissue. The other physical signs, such as increased tactile fremitus, dullness, bronchial breathing, and bronchophony, are due to the solidification of the lung tissue. The consolidation is due to the obliteration of the normal air spaces by exudate, which has interalveolar capillaries, with the exception of the fibrin and desquamated epithelial cells of the air-sacs. The fibrin, one of the main constituents of the exudate, does not appear early in the pneumonia because it is derived later from the elements of the exudate which has already arrived. Fibrin, unlike the neutrophils, serum, and red blood cells, is subsequently formed in the air-sac spaces, the result of fibrinogen and lime salts of the serum and nucleoprotein or ferment from the disintegrated neutrophils.

The greatest degree of solidity in lobar pneumonia is when the maximum of fibrin has been obtained. The lung at this period is not only solid but granular, gray, and dry. The degrees of consolidation are explained by the character of the exudate.

Early in the disease the exudate is chiefly serous and does not take up the entire air spaces, which gives you a less firm consistence, together with considerable sponginess because of the contained air not yet excluded; later in the disease the exudate bcomes less fluid and more solid because of the appearance now of more cells and fibrin and the complete exclusion of air.

It must be remembered that after the crisis the lung again approaches the original consistence by passing from the greatest degree of firm solidity to a semi-fluid and then a fluid, and finally an air-containing fluid consistency, indicating that the air is again returning.

What is the fate of the exudate which occasions the solidification so characteristic of lobar penumonia? Some may think that the

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greater part of the exudate is expectorated or in this way eliminated from the involved lung. In this connection it can be emphatically stated that comparatively little of the consolidating material is thus eliminated.

The exudate is gotten rid of by what is known as the process of resolution. Now, in reality resolution means the absorption of the digested, and in consequence liquefied exudate which everywhere fills the air-sacs. This digestion of the exudate is brought by a proteolytic ferment derived from the disintegrating pus cells (Polymorphonuclear Leukocytes) of the exudate.

The digestive action of the ferment renders the various elements of the exudate into a liquid form which in turn is taken up by the circulation and ultimately returned to the tissues as pabulum in the form of end-products of protein cleavage (Amino-Acids). The excess fluid of the digested exudate is eliminated from the body by way of the kidneys, skin and intestines.

In uncomplicated pneumococcal pneumonia the infection ends by what is termed crisis, while in the other type of pneumonia the common termination is by lysis. The sudden fall of temperature to normal (crisis) is due to the complete neutralization of specific poison by immune substances produced in and by the patient, in other words an immunity has at this joint been established. Prior to the crisis the body cells have been active in the production of antibodies under the stimulation of the bacterial poison.

The fall of the pyrexia by lysis in pneumonia is explained by the fact that there is more than one infecting agent; in other words, there is a mixed infection, various unrelated poisons have to be neutralized and the host who is responsible for the neutralizing substances is unable to produce simultaneously the same amount for each.

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The common symptom known by the term "expiratory grunt" is an expression of pain on the part of the patient caused by the involvement of the pleura and occurs on expiration.

The blood pressure in pneumonia shows practically no change from the normal in the first few days. As the myocardium becomes affected by the toxin there is in consequence a fall in the blood pressure. It may be said that the blood pressure and the pulse rate bear an inverse relation to each other. The weaker the heart muscle grows the more rapid becomes the pulse rate and the lower the blood pressure.

It is not a favorable sign when the blood pressure continues to fall or does so suddenly. The urine picture is in no manner significant and it may be said to be that of any acute infectious disease. Special mention may be made, however, of the chlorides which are greatly diminished during the active stage of the disease and markedly increased when resolution has set in.

Having determined a diminished chloride content and subsequently to find an increase is indicative of the lung resolving a favorable prognosis. In explanation of increase chlorides in the urine we have the digestion of protein which is taking place in the affected lung.

(*Treatment follows in No. 2.*)

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RABIES

Lecture by Geo. S. Bel, of Tulane

Rabies is an acute infectious disease of unknown etiology, commonly occurring in certain of the lower animals, particularly the domestic beasts, such as the dog and cat, and communicated to susceptible animals by the saliva of the infected. It may be stated that all warm-blooded animals are susceptible to the virus of rabies, presumably contracting the disease when an open wound is brought in contact with the saliva of a rabid animal. In man rabies is always an accidental infection and to be regarded as comparatively exceptional since the human is not the natural host, consequently refractory to the specific agent. However, the infection in man is of serious moment, ending as it does fatally in all cases not receiving specific prophylactic treatment.

The transmission of the virus is invariably by means of the saliva, which is introduced through a break in the skin caused by the bite from the infected animal. The incubation period for man may be said to range from sixteen to forty days. Rarely is this period under twenty-one days. I have observed it but once, and here the infection developed in a child on the sixteenth day following the bite inflicted by a rabid dog. It is extremely doubtful that the incubation period is ever more than six or eight weeks. The average duration is one month. Twelve days is the largest time reported between a bite and the appearance of symptoms in the dog. Therefore if an animal is kept under observation for this period after biting the human, without developing symptoms, he may be pronounced free from suspicion.

The etiology of rabies still remains obscure. While much has been written upon the subject all that is definitely known is that the virus is filterable and resists for long periods conditions ordinarily

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detrimental to pathogenic micro-organisms for man. The desiccated tissue containing the living virus retains its infectivity for years when kept away from light and moisture and at a low temperature (O°C). The virus possesses a predilection for nerve tissue though it has been found in other tissues of the infected animal. In the nerve tissues changes in the cells are noted that are pathognomonic of the disease. The so-called "Negri bodies," at one time regarded as the specific parasite of the infection, invariably are to be found in the Perkinjie cells of the central nervous system. These "bodies" though absolutely diagnostic, are no longer regarded as the causal excitant, but merely specific protoplasmic cell degenerations. So remarkable are the "Negri bodies" in tinctorial and morphological properties that they are entirely dependable for diagnosis. Such being the case it is the duty of the physician to have these "bodies" searched for whenever possible, in animals suspected of having rabies, before deciding anti-rabic treatment for the human case that may have been bitten. So constant and numerous are these "bodies" in the brain tissue of infected animals, and so easily discerned and differentiated that it is unnecessary to institute treatment for the exposed human case in the event they are not found. It should be mentioned that the virus of rabies leaves the infected host in the saliva. This medium is probably the only one through which the specific agent is transmitted from the infected to the susceptible.

The rapidity of the onset of symptoms following the introduction of the virus is determined by the part of the body bitten. Wounds about the face and head result in infection earlier than those about other parts of the body, which is explained on the relatively greater and richer nerve supply. The early symptoms of rabies in man are as a rule insignificant and not characteristic, and for this reason too often regarded as of no special importance by the attend-

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ing physician. For several days after the onset of the disease the patient may only appear depressed and melancholy. The complaint at this stage of the infection is that they are suffering with a mild, though persistent headache, loss of appetite, and an indisposition for the daily routine. The symptoms become more pronounced, the patient lapsing into stupor from which it is difficult to arouse. This is the so-called "dumb rabies," the form of the disease in man more often encountered. There may be a slight rise in the temperature, one-half to one degree, but usually the temperature is normal or subnormal. This condition may persist until the end, the patient dying in a state of coma without any detectable paralysis.

On the other hand the disease may manifest itself from the beginning by a marked irritability and extreme restlessness on the part of the patient. In this, the excitable form of rabies, there is a constant sense of impending danger, the result of difficulty to swallow solids or liquids. The temperature is elevated (101°F-103°F), pulse over 100 and irregular, and there is an extreme degree of hyperanaesthesia. External stimulus often causes violent reflex spasm, especially of the throat muscles. To take food or water occasions intense pain in the muscles of deglutition. It is this which makes the patient dread the very sight of water (hydrophobia). During the course of the maniacal form of rabies there are intermittent fits of wild delirium, accompanied by violent muscular contractions. Death may intervene during tonic convulsions where the muscles of respiration are involved. In the intervals between the patient is quiet and the mind clear. The furious stage may last from two to five days before the patient lapses into permanent unconsciousness and paralysis. The heart action becomes more and more embarrassed and death occurs by syncope. During this stage death may occur at any time due to cardiac or respiratory paralysis.

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RABIES

The treatment of rabies is preventative and not curative. Once the symptoms of the disease have appeared the case is hopeless from the standpoint of cure. No specific therapeutic measures are of the slightest avail, consequently the treatment must be palliative.

Preventive vaccination, known as the Pasteur treatment after the celebrated discoverer, is the only sure and rational procedure in all cases bitten by rabid animals. It may be said that the specific prophylactic treatment is almost always efficacious when instituted during the early part of the incubation period of the disease. This in man is rarely under three weeks, which allows good time to establish an active immunization in the person bitten. In my experience vaccination has failed only in two cases out of many hundreds treated by me during the past ten years, where the vaccination was begun within five days following the rabid bite. A safe rule is to institute treatment within the week after exposure, and to push the treatment fast by giving large doses of the fixed virus. The old method of Pasteur requiring twenty-one days to complete treatment is no longer thought necessary. The same degree of immunity can be accomplished in one-half the time.

The treatment is simply the production of an active immunity during the early part of the prolonged incubation period for rabies. If the patient comes under observation early, a high degree of immunity can be produced within two weeks, thereby anticipating the original infection by several weeks.

The original method of Pasteur was the subcutaneous introduction on successive days of material from the infected cords in which the attenuated virus was of varying degrees of intensity. This treatment required twenty-one days for its completion. While the old Pasteur method is efficient, immunity may be established in a much

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shorter time and with less discomfort to the recipient and the dose more definitely regulated, and a shorter period of treatment in definite unit quantities by the use of the newer method of Harris. In the Harris method the "fixed" virus is standardized, which makes possible the administration of known quantities of the material. This effective newer treatment consists in successive subcutaneous injections of saline suspensions of the desiccated cord and brain of the rabbit in whom rabies has been intentionally produced. Two hundred and fifty units of the "fixed" virus (rabbit) is given as the initial dose, increasing this amount at the rate of 250 units daily until 1,500 units are being administered. In patients who have received bites about the face and head the course of treatment is fourteen days, while for those who have been accidentally infected through breaks in the skin on other parts of the body, eleven days' treatment is all that is necessary to bring about an immunity sufficient to prevent the natural infection.

The anti-rabic vaccination treatment is attended with little or no local and constitutional ill effects. Toward the end of the treatment period a transitory zone of erythema may occur about the inoculation sites. This is of no moment and disappears in a few days. It is well to cauterize the wound thoroughly, even in cases in which the anti-rabic vaccination is to be instituted. Early cauterization undoubtedly rids the wound of much of the virus which otherwise would reach the central nervous system.

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Surg.

ABDOMINAL OPERATIONS

Post-Operative Quinine Treatment. Dr. H. Burkard. Zentralblatt f. Chir., Leipzig, No. 22, 411.

After abdominal operations it is frequently the case that the patients complain of fever, tired feeling, loss of appetite, headache, etc., though no cause for these symptoms can be ascertained. Dr. Burkard found that by the administration of small doses of sulphate of quinine these untoward symptoms disappear at once. The temperature sinks and the general condition improves. The dose of quinine is .2 c. c. 4 to 5 times daily. If disagreeable symptoms like noises in the ear or vomiting appear, the dose may be reduced. This treatment may be continued for two or three weeks after the operation. Salicylic acid or antipyrine will not have the same effect as quinine.

(Ed. Note—This result is probably due to the fact that quinine increases the amount of oxygen caused by red blood cells, etc.)

Med.

ABSCESS—HEPATIC

Contribution to the Therapy of Dysenteric Abscess of the Liver. Manini, Rome, Il Policlinico.

Under the above caption Manini quotes Professor Pontano, who in a recent publication reports brilliant results in the treatment of hepatic abscess with emetine.

He asserts that emetine is not only capable of successfully combating amebic dysentery and preventing the complications, but that after the development of the abscess emetine will not only completely sterilize the contents of the abscess but cause resorption.

Others have recognized that this treatment was capable of steril-

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izing the contents of hepatic abscess of dysenteric origin, but maintained the necessity of emptying the cavity by surgical means. Pontano claims that this is not required, as emetine alone will bring complete restoration to health. He explains ingeniously the happy result that the injection of emetine has on the abscess contents by a parallel between hepatitis amebica and syphilitic gumma; in both conditions the morbific causal agent is a protozoon, and in both, under the influence of the specific treatment, the morbid product is rendered innocuous and resorbed.

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ACIDOSIS

Acidosis in Acute Affections of the Abdomen. M. Labbé. Le Progrés Médical. Hebdomadaire. Academie de Medicine, Paris.

The study of acidosis has taken a growing importance in the pathology of medicine and surgery. Its clinical interest requires that it must be systematically searched for.

Diaceturia and acetonuria are the two fundamental indices. It is rare in general infections, but it is frequent in the course of acute inflammations of the abdominal viscera, especially in appendicitis and cholecystitis. In these affections acidosis is in rapport with the intensity of the inflammation, it disappears with the abatement of the fever and reappears in case of relapse. The acidosis is not due to the fasting imposed on the patient nor to operative intervention, nor to the anesthetic. It is caused by retention of infection in the liver; what proves this is the coexistence with the diaceturia of the indices of hepatic alteration: urobilinuria, ammoniuria, aminoaciduria.

That pathogenesis is identical with that which M. Labbé has put in evidence in the grave acidosis without diabetes, it being understood that acidosis is especially frequent in the course of inflammations situated in the domain of the portal vein. The acidosis should be combatted by the administration of alkalies of which sodium bicarbonate and magnesium oxide are best suited. The underlying cause should receive proper attention in addition to the treatment of the acidosis.

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Med.

ALBUMINURIA

Albuminuria Following Interventions in the Nasal Fossa and Its Clinical Interpretation. (Albuminurias consecutivas a las intervenciones en las fosas nasales y su interpretación clinica). Dr. J. M. Barrajas y De Vilches. Medicina ibera, Madrid, No. 81, 141-143.

In a number of cases in which the author performed operations in the nasal fossa there appeared albumen in the urine a few hours after the surgical intervention. This albuminuria was especially marked after turbinectomy and in cases of hypertrophic rhinitis which were treated by galvanocautery. But the albuminuria was only observed when the operative intervention concerned the external wall of the nasal fossa. Though the albuminuria may be very marked it disappears again after a few days. Dr. Barrajas ascribes this phenomenon to a reflex action which, starting from the pituitary membrane of the nose, reaches the kidney through various nerve centers especially those lying in the medulla oblongata.

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Med.

AORTIC ANEURYSM, MEDICAL TREATMENT OF

W. W. G. MACLACHLAN, American Journal of the Medical Sciences

The purpose of this article is to emphasize the necessity and value of medical treatment in a condition which too often is regarded as hopeless from the point of view of therapy. The aneurysms under discussion are of the thoracic aorta, and have as their etiological background the disease of syphilis. One does not, however, wish to convey the impression that syphilis is the only cause of aortic aneurysm. The relation of syphilis to thoracic aneurysm has been so clearly shown by clinical, serological and pathological workers that one is not surprised at finding the two conditions, in fact, really one disease, together in almost 90 per cent. of the reported cases.

It is advantageous to recall, briefly, the lesion produced in the wall of the aorta by the Spirocheta pallida. The nature of the process is well established, and in practically all of the text books of pathology it is minutely described. We would, however, refer the reader to Longcope's article, which discusses this subject in a very complete way. Syphilis produces in the wall of the aorta a granulomatous inflammation extending from the adventitia into the media and intima. The perivascular channels about the vasa vasorum of the outer two coats appear to be the road along which the spirochete passes, and it is well to keep in mind that this organism has been found in all of the layers of the aorta. Hence the presence of granulomatous tissue in any portion of the wall is to be expected. The media and adventitia show the greatest inflammatory reaction. The destruction of the media, composed as it is chiefly of elastic fibers, is considerable, the amount depending upon the severity of the process. This naturally leads to weakening of the wall, and nature attempts repair by laying down fibrous tissue, the contraction of which in part gives a peculiar characteristic wrinkling to the intima, which is so valuable a sign in

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the gross diagnosis of syphilitic aortitis. The adventitial reaction is of the same type, but here one sees more connective tissue change and more marked perivascular infiltration of lymphoid and plasma cells. Patchy intimal thickening is very evident.

Further, and of considerable importance, is the variable amount of gummy necrosis in the wall. From a pathological point of view there is really no difference, save one of degree, in the inflammatory process of a syphilitic aortitis, with or without aneurysm. We have never seen an aneurysm which came to autopsy that did not show evidence of gummy necrosis in its wall, at times seen only microscopically, but often apparent in the gross.

That the fibrous tissue areas representing healed lesions seen in the wall of a syphilitic aorta or an aneurysm lying between the ruptured elastic tissue fibers stretch under the constant pressure is most likely, but we do not feel that this plays a part of any importance in the actual production of the lesion; further, it seems to us as most improbable that the rupture of an aneurysm is ever due to the breaking or giving way of this fibrous tissue.

It would seem therefore rational that the therapy of aneurysm should be directed primarily against the spirochete with the idea of its destruction, which would be followed by the eventual absorption of the inflammatory process in the wall of the vessel and the subsequent replacement fibrosis or healing. The results would depend a great deal upon the amount of damage done and how thoroughly we are able to sterilize the areas infected by the spirochete. Assuming that this latter condition is a possibility, does it not suggest a more favorable outlook for these cases? The fact that an occasional spontaneously healed aneurysm is met with, certainly seems to indicate that an enlarged thoracic aorta, if quiescent, is compatible with life. From some limited observations on aortic aneurysm during the past

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three years we feel that the condition is by no means as hopeless as is ordinarily considered.

The prognosis of this lesion has always been very poor. It is well known that a certain number heal spontaneously. They are met with occasionally at autopsy. On the whole, however, this fortunate group is not very large and there are probably very few physicians who have clinically diagnosed aneurysm and who have seen a so-called spontaneous cure on the same patient. Osler gives almost a hopeless outlook, but calls attention to the fact that some even unusually large aneurysms have been known to last for many years. These, he says, are not common. Of the majority, after diagnosis has been made, a period of one or two years usually sees the end. Excepting the unusual case one would be correct in saying that thoracic aneurysm is a fatal condition in a relatively short period of time after symptoms develop. This is the consensus of opinion as given in the modern textbooks and other literature.

The commonest cause of death is rupture of the sac. This rupture, we believe, is due to the giving way of the neurotic and inflammatory tissue in the wall of the sac and not the breaking or tearing of fibrous tissue which represents healed portions of the wall. Fifty-three per cent. of the 1,829 cases referred to by Arnold died of rupture. Cardiac failure from myocardial and aortic valve disease, angina pectoris, asphyxia, edema of lung, hypostatic pneumonia, tuberculosis or other intercurrent infections make up the rest of the list. Even if the death is not due to rupture of the sac most of the other causes are more or less directly dependent on this large mediastinal mass. The aneurysm itself is therefore directly or indirectly responsible for the great majority of the deaths from this condition.

The medical treatment of aneurysm, as judged by past clinical experience, has not been brilliant in its results. There is always a

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fatalistic touch to what is written on this part of the subject. At the best the most one appears to be able to do is to relieve untoward symptoms temporarily, particularly if the lesion is at all advanced. Most authors speak of the use of mercury in those cases in which the luetic infection is known to be of a relatively recent date or where the aneurysm is supposedly small. The use of mercury, however, is not emphasized but rather gives one the impression of being suggested en passant. Certainly it is not brought out with the same force that one indicates when referring to tertiary lues of almost any other source.

Potassium iodide, on the other hand, has been the drug of this condition for many years. It is astounding to note how often this drug alone is given in aneurysm, when with any other tertiary luetic lesion the solitary use of iodide would be considered an inexcusable error, as it is the general belief that potassium iodide, although having great power in stimulating absorption of the syphilitic process, does not kill the Spirocheta pallida and hence does not reach the cause of the disease. We cannot help but feel that in the treatment of aneurysm not enough attention has been focussed on the inflammatory lesion in the wall of the aorta. It is here that the cause is to be met, and it does seem rather futile to hope for results if we do not try to render the aortic wall free from the infection. As far as we know mercury and arsphenamin preparations are the only ones capable of destroying the spirochete. The cardinal principle then in the treatment in which we are striving for a possible cure in the early cases or for palliative effects in the late is to deal with the process as a syphilitic one and to apply, as fervently as possible, anti-syphilitic remedies. Let us attempt to heal the inflammatory lesion in the wall and trust to the patient to fill up the sac with a fibrin clot. There are several points to be observed in the treatment which it would be well to briefly enumerate.

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AORTIC ANEURYSM, Medical Treatment of

1. *Rest.* As soon as the diagnosis is made the patient should be put to bed and kept there for as close to three months as possible. We allow them to get up to go to the toilet. As has been pointed out by Osler, many aneurysms will become symptomless on this rest alone. It is of the greatest value, and any treatment that does not take into account a prolonged rest in bed is falling far short of the ideal. Following the period of almost absolute rest, for the remainder of the year the patient should be limited in his physical work. We do not consider it wise to eliminate all activity, for, as a matter of fact, very few people are financially or mentally able to withstand a year of complete idleness. Undue exertion, worry, and extra mental effort are to be avoided and this should more or less be the basis for the remainder of the patient's life. It has been our experience, however, to deal with patients that were unable to take more than six weeks' rest, and following this go back to their former occupations. A change of occupation to something less strenuous is always advisable. We believe it is a good thing in many ways to have the individual kept moderately busy, as this is the best way to eliminate worry.

2. *Diet.* The old treatment was more or less based on diet and rest. Valsalva rested, starved and bled the patients. It must have been a very rigorous case which survived, and probably the remark that the cure was as bad as the disease was more or less true. This form of treatment was supposed to put the patient in so low a condition that the blood-pressure on the aneurysm would be greatly reduced, also possibly the coagulation or fibrin formation in the sac would be increased. The first part undoubtedly was attained. Osler recommends bleeding as an emergency measure, particularly for some severe cases of dyspnea. We have seen one case given considerable relief by this procedure. Bleeding was a very important

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part of the Valsalva treatment, but now it is only used as an emergency method for relief. Futcher has shown that there is no evidence to indicate the value of gelatin as a measure to stimulate coagulation in the aneurysmal sac. We do not use the calcium salts either for this purpose. Tufnell's diet is of more recent date. The patient was rested in bed and given a very reduced fare, consisting of 8 ounces of fluid and 10 ounces of solids per diem. This also is very severe. Lowering of blood-pressure, inducing fibrin formation and the benefit of rest, were the claims made for this diet. The rest is of undoubted value, but the supposed increased coagulation of the blood brought about by this method has been disproved by A. E. Taylor on two cases studied some years ago. Clinically the method is more or less discarded. We believe in moderation in this matter. If the case has a fairly high blood-pressure then a light diet is indicated. At the same time we feel that the general nourishment of the patient is to be kept as close to normal as possible. In some of our cases the diet and fluid intake were moderately limited, but in others no change was made. Our impression is that the diet is of minor importance and we can see no advantage in having the patient undernourished.

3. *Antiluetic Treatment.* Potassium iodide in moderate doses (gr. XV three times a day) is the drug method of treatment used for many years. The dosage may vary considerably, but the above quantity usually is sufficient for most cases. It undoubtedly has great value, as the severe thoracic pain generally is readily controlled. The ability of potassium iodide to hasten the absorption of luetic inflammatory tissue is to be kept in mind. But, as far as we know the Spirocheta pallida is not affected by this drug, hence we cannot hope to stop the inflammatory process in the wall of the aneurysm by its use alone. As in tertiary syphilis elsewhere, mercury

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and arsphenamin must be added. Mercury in some form should be given and kept up for the same period as we would demand in syphilis. We have no special preference for the way mercury is to be applied. While under our care in the hospital the daily inunctions were used, but wher the patient went home a form taken by mouth was substituted. Gray powder was often the choice.

Arsphenamine (diarsenol) in our hands has been quite safe and of great value. Longcope strongly recommends it in his work. We have given many injections in aneurysms and have never seen any ill results. The dose should always be small and repeated at weekly intervals. We recommend that the patient receives at least 12 injections, each of the first being 0.2 gm. and the remainder 0.3 gm. We never give a larger dose, as we desire the patient to be free from any straining as would occur in vomiting. The arsphenamine is given while the patient is resting in bed, hence the value of making the primary rest as long as possible. In one case we gave fifteen injections. We have no definite rule, save the general condition of the patient and the Wassermann reaction to know when to discontinue the therapy. This is a very difficult problem to decide in aneurysm or in any form of syphilis. It is our intention to treat all cases actively for at least two or three years if this is feasible. We lay great importance to the frequently repeated small injections of arsphenamine at the onset during the period of rest. This is really all we have to offer, namely, treat aneurysms intensively by antiluetic measures. There is, of course, nothing new in the method, but, taking the disease as a whole, one would be surprised, we believe, to know how few aneurysms ever receive mercury or arsphenamine. From our experience there is no contradiction to the use of the latter drug. We have given it, with very gratifying results, in a case in which the aneurysm was of enormous size, bulging through the chest

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wall. The solution given was never more than 100 c. c. and always diluted at least in the proportion of 0.1 gr. for every 25 c. c. of distilled water.

The following is a brief report of the salient points of our cases. From this very small list and the short duration under treatment it would be unwise and further incorrect to be too sanguine as to the ultimate value of the therapy, but there are some points which have been so different from our past experience that we feel justified in continuing this method and in presenting these facts.

We have had seven cases to observe in a period of three years, four of these are unsatisfactory from the point of record in that we have lost track of them since leaving the hospital. They seemingly did not wish to cooperate even while in our care. They were given four injections of arsphenamine (0.2 gm.) each during the month spent in the hospital in addition to the mercurials and iodide, but at the end of this time they departed against advice. Subjectively they were free from symptoms, and this is probably why we were not able to hold them further. Despite promises to return for observation they have been entirely lost sight of. It would be very unwise to say anything further on this group, except that they took the antiluetic treatment well and improved with one month's rest. Two of these aneurysms had all the physical signs of being large and well advanced.

Of the other three we have more complete records. They are under our observation from time to time.

Case I. O. K., aged thirty-six, molder, primary lesion fifteen years before onset of symptoms, enjoyed excellent health until July, 1916, when he suddenly developed attacks of dyspnea of a paroxysmal type, accompanied by substernal pain. He was sent by his physician to Dr. B. M. Dickinson for a nose and throat examination. This was negative, and he was referred to the medical service of Dr. J. A.

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Lichty in August, 1916, or six weeks after his first symptoms. The physical examination showed a very apparent pulsation in the first and second interspaces on the right and in the episternal notch, with a distinct lifting of the sternal end of the right clavicle with each pulsation. An expansible character was noted by palpation. There was increased dulness to the right of the sternum above the level of the upper border of the third rib. The heart sounds had the peculiar quality heard in dilated aorta and further showed a systolic bruit. The auscultatory signs were most evident just under the clavicle. Roentgen rays showed an enlargement of the ascending aorta, with a sacular-like bulging where it curved into the arch. The arch was but moderately involved in the dilatations, while the descending thoracic aorta appeared normal. By fluoroscopy an expansile pulsation in the aortic bulging was clearly seen. The Wassermann reaction was positive. The heart appeared normal, as did the rest of the systems. There could be no doubt of the diagnosis of aneurysm of the thoracic aorta.

The patient was eager to get well and remained in bed six weeks. He was given a general diet and allowed to go the toilet. Potassium iodide, gr. XV, three times a day, ℥j of ung. hydrargyrum rubbed into the skin daily, and 0.2 gm. arsphenamine once a week for six weeks was the therapeutic procedure while he was in the hospital. He showed no untoward symptoms after the intravenous injections. He had two attacks of dyspnea during the first week in the hospital, but after this he was free from symptoms and confessed to feeling perfectly well. On his discharge, as he was an intelligent fellow, we instructed him to keep up the iodide and the mercury inunctions which he has followed, we believe, faithfully for three years. The dose of the iodide was, however, diminished, as lately he has become somewhat intolerant to its use. He returned weekly to the hospital for one month after

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discharge and four doses, 0.3 gm., arsphenamine were given. In January, 1917, he had three more injections of 0.3 gm. arsphenamine. This was the final number. We have now taken him off mercury after a three years' course. A rapid review for the past three years has some points of interest: He has been apparently perfectly well and has worked almost every day since leaving the hospital. We cautioned him against working too hard, but to no avail. Before leaving the hospital our intern, with most characteristic Teutonic diplomacy, told him frankly that his case was hopeless and some day he was going to choke to death. This remark we know has never entirely left his mind and accounts for his subsequent, almost foolhardy actions in working. In July, 1917, one year after the onset, he was in apparent perfect health, the Wassermann was negative, but we could get typical physical signs of an aortitis or a dilated aorta, and the roentgen rays showed almost the same picture as they did the previous year. He was able at this time to pass a fairly close physical examination into a large manufacturing concern, where he made shells for eight months. This work entailed the lifting of 130 pounds (the shell weight) between 100 and 120 times a day, certainly the last thing in the world for a man with an aneurysm to attempt. The reason for this was an economic one: shell-making was a remunerative job, and he desired to leave as much as possible to his family, firmly believing that the ill-advised remark of the house man might come true any day.

He, however, appeared to be none the worse for this physical test, but was willing to get much lighter work, which he has been doing up to the present. Even the present work, in charge of the repair shop of a garage, gives him very long hours and is relatively hard. Six months ago he fell off a ladder and broke the seventh rib in the anterior axillary line. At that time he noticed very carefully

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for any sign of pain or discomfort over the aortic area, but none was present. Today he feels perfectly well, looks outwardly in good health, shows signs of slight aortic dilatation which we would call an aortitis if this were the first examination. His Wassermann is negative. The roentgen rays indicate that he still has his dilated aorta, or aneurysm, with some calcification in the sac wall. There is no expansile pulsation to be palpated, and there is very little evident expansion under the fluoroscope. We do not believe the sac has enlarged.

This type of aneurysm, of course, is the favorable one, and we probably saw it fairly early, although he must have had his aortitis for a considerable time. We trust the sac is filled with organized clot, but we do hope there are no living spirochetes in the wall of the aorta or elsewhere. We are under the impression that if fibrous tissue has replaced all the damage done to the coats of the aorta that this reparative process will, from the point of view of function, carry on for some years.

Case II. P. G., aged thirty-five years, laborer, came to the hospital July, 1918, with a pulsating mass protruding in the second right interspace immediately to the right of the sternal border. He complained of some coughing and pain of a sharp, cutting character, usually noticed at night in the chest under the sternum; he could only sleep sitting up in bed or in a chair, could not lie on his side nor could he bend over, and he was forced to stop work on account of the pain produced on using his arms. He is an Italian, and during his stay at the hospital was most difficult to handle. The diagnosis was so evident that we are only mentioning one or two points. The pulsating expansile mass on the right side of the upper chest protruded between the second and third ribs. It was round at the base, having a diameter of 4 cm., the ribs being pushed apart, and it extended out-

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ward 2 cm., from the chest wall. The surface had a gentle curve, with a tendency to taper upward the outermost portion. A very marked enlargement of the aorta, by percussion, was easily demonstrated on both sides of the sternum, and the roentgen-ray plate showed the aortic shadow to be as large as the heart. The ascending aorta, arch and part of the descending thoracic aorta was involved. The fluoroscope showed it to be a pulsating expansile mass. Undoubtedly the aneurysm was a very large one. The Wassermann was positive. The primary lesion was denied. There was a slight regurgitant aortic lesion, but not a great amount of cardiac hypertrophy was present, and the heart's action was regular and of good quality.

We are very unwilling to try arsphenamine, and, in fact, kept him under observation for two weeks before giving the first injection; but we concluded that from the man's point of view it was worth the risk. It was the size of the aneurysm that made us hesitate. He took the arsphenamine perfectly and was given ten 0.2 gm., and four 0.3 gm., in all, over a period of fourteen weeks. Potassium iodide, gr. XV, three times a day, and a daily inunction of mercury were given while in the hospital, a period of sixteen weeks. These last two preparations had been used from the first. After leaving the hospital we gave him gray powder and iodide, as we felt sure he would not apply the ointment. We now know definitely he has not taken any medicine since leaving us. It was practically impossible to get him to stay in bed, and only on account of his interesting lesion did we tolerate his disobedience. After two months the aneurysmal sac protruding from the chest wall showed signs of decreasing in size, and at the end of sixteen weeks it had entirely disappeared, the chest wall anteriorly resuming a normal contour. The second and third ribs had a normal relationship, although we could distinguish on palpation some irregular thickening along the free margins. In the in-

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terspace one could readily get the pulsating sac with the tip of the finger. This disappearance of an aneurysm from the surface is known to occur, and it sometimes happens at the expense of growth of the sac elsewhere. We had no indication, however, of this occurring. The patient during the last month seemed to appreciate he was improving, and we were able to get him to rest in bed for a few hours during the day. His symptoms, save for an occasional brassy cough, disappeared, and he left the hospital feeling well and intending to go back to work at once on a light job. His Wassermann reaction at the end of his hospital stay showed a negative fixation with the lipoid, but definite positive with the cholesterin antigen. The roentgen-ray picture gave a shadow of about the same size as at the onset. He was on a general diet. After leaving the hospital, which he did on account of the inrush of influenza patients, we heard of him only indirectly. It was impossible to get him to report, and only through the kindness of one of the officials of the steel company where he was employed were we able to get in touch with him. After fifteen months he made his first appearance, and he really looked very well. He has been working steadily since leaving the hospital, and his work has not been at all times, by any means, what we would call light or easy. The physical signs are just what they were when he left. The roentgen rays and fluoroscope show that the sac has not changed any in that time. He stopped taking mercury and potassium iodide the day he left the hospital, as we imagined he would. The Wassermann reaction now is strongly positive with both antigens. We gave him some good, sound advice, put him back on mercury and iodide and commenced another series of arsphenamine injections, but after two weeks he again disappeared, and in all probability will not return until he develops more symptoms. Unfortunately, however, we are losing or have lost the good start we made last year in this case. It

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is too bad that this patient is so refractory, because if one could get some results with an aneurysm of this size under difficulties then we should be able to do a great deal more when conditions are more favorable. This aneurysm is undoubtedly very large, and when we consider that over a year ago he was not able to sleep except sitting up, could not bend over or lie on his side, and had a very harassing cough, with a good deal of thoracic pain, we must conclude that from the point of general well-being he is clearly improved. This we would hardly expect without treatment after fifteen months in an aneurysm of this size. It is further very unfortunate he did not take the mercury as directed during the past year.

Case III. W. R., aged forty-two years, was admitted to Dr. J. A. Lichty's service in August, 1918, suffering from nocturnal dyspnea and severe, almost constant, deep thoracic pain, which at times was cutting in severity. These symptoms appeared in January, 1918, but for the year before that he had been in rather poor health, although not suffering especially from the chest symptoms. A very large aneurysm, involving the greater part of the thoracic aorta, was readily apparent on physical examination. A diffuse throbbing pulsation of the whole upper chest and vessels of the neck, dullness on both sides of the sternum above the cardiac area, particularly on the left side, tracheal tug, systolic murmur over dull area, expansile enlargement almost of the heart size by fluoroscopic examination and roentgen-ray plate, typical of a large thoracic aneurysm, chiefly of the arch and first part of the descending aorta, could be made out. The Wassermann was strongly positive. There was a regurgitant lesion at the aortic valve and some left-sided cardiac enlargement. Compensation appeared to be good. An indefinite primary lesion was present twenty years ago. He remained in bed for the month of August. He unfortunately could not rest for a

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longer time, as it was practically impossible for him to get away from his business. He was virtually alone for one continuous year without a day off, after his rest in the hospital managing a busy retail hardware store in one of the very active towns of this district, and to make matters worse, the influenza epidemic carried off his head clerk, so that for this patient mental and physical rest, which is so important, was not only absent, but the opposite state of affairs existed. He was forced to follow this course, knowing the dangers, but as his partner was an officer in France, he felt it to be his duty to conduct the business even to his own detriment. Potassium iodide and mercury have been faithfully followed for fourteen months. He was given six intravenous injections of arsphenamine 0.2 gm. during the first six weeks and two courses of three injections of 0.3 gm. at weekly intervals in October and November, 1918. There was no reaction after any of these injections. The dyspnea had disappeared by the time he left the hospital, but he continued to have some thoracic pain for two months longer, but this was very mild in comparison to what it had been. He has reported about once a month up to the present time. At this date, which is fourteen months after the treatment began, he is much improved. He occasionally has had slight thoracic pain, but it is a very infrequent occurrence now. There is no dyspnea. He is able to sleep readily, a thing which one year ago was impossible. To use his own words, "He feels 100 per cent. better today than one year ago." The physical signs, however, really do not show much change. The roentgen-ray shadow is of an alarming size. There is a very definite diminution in the visible thoracic pulsation, but otherwise the signs are about what we described. The Wassermann is negative. He has gained twenty pounds since the treatment began. We intend to give more arsphenamine and of course continue the mercury and iodide for a year or more at least.

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The aneurysm in this patient is also a large one. At the end of fourteen months he is certainly in much better shape, having put on twenty pounds in weight, and now being practically free from symptoms. The diminution in the heaving pulsation over the upper chest, which was most marked one year ago, is very noticeable. This is about the only outstanding change in the physical signs. He is fortunately now situated in such a way that he will be able to take more rest. Here, again, the general improvement after a period of over one year is rather more than one would expect from a case of this type.

Discussion. We frankly admit that our cases are too few in number and the time under treatment too short to allow us to make any dogmatic statement on the prognosis of this disease. The opportunity to study cases of this type for considerable periods is not always available, and therefore one must make the best of what is to be had. It is easy enough to observe a fair number of aneurysms, as the condition is by no means uncommon; but in our experience it has been a very difficult matter to keep in touch with these patients. In order to estimate the ultimate value of a *regime* such as we have suggested, it is necessary to follow a number of cases for several years.

We wish to emphasize, however, the general improvement noticed in three cases of aneurysm, two of them of massive size, after a period varying from fourteen months to three years. We are at present inclined to feel that the absence of symptoms, the ability to do the day's work and the general improvement in health are to be taken as the index of the results of therapy. The changing of the Wassermann reaction at the end of the first year is important, but of much more value is the negative Wassermann at the end of several years. We regard it as being very unwise to stop treatment too early on account of a negative complement-fixation.

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AORTIC ANEURYSM, Medical Treatment of

The physical signs of a dilated aorta and the lack of any special change in the roentgen-ray picture might at first be considered as proving the failure of therapy. This, however, may not be the case. After an aneurysm has developed it is most likely an impossibility for the normal ever to return, and hence the shadow cast is going to be more or less as before. With early sacculations one might expect considerable alteration in the size after treatment, but we hardly look for any change in aneurysms of the size of our last two cases. The roentgen-ray plate does not indicate whether the inflammatory process in the wall has subsided or not. In fact, there is no way of being sure of this point at the present time. As long as the aortic enlargement does not appear to be increasing in size, and associated with this there is a general improvement in the patient we are not going to worry over the fact that the sac shows no signs of returning to the normal. In Case II there was a visible mass in the chest wall which disappeared, but this may not mean that the whole sac was any smaller. The development of what does appear to be a fine layer of calcium in the sac of the first case three years after treatment began is of interest from several points of view. In the first place calcification and syphilitic lesions of the aorta do not, as a rule, go together. One sees very few aneurysms at autopsy showing any evidence of calcification in their walls. It would be very interesting to know whether the so-called spontaneously healed aneurysm, which we know occurs, has calcium deposits in its walls, and also whether a positive history of syphilis is present. One is tempted to ask if in our case this deposit bears any relation to or is an index of healing. At the present time, however, we are able to do little more than note its occurrence.

We admit that we are favorably impressed with the results so far observed, and therefore feel justified in recommending more active anti-syphilitic treatment for aortic aneurysm.

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Surg.

ASCITES

A New Operation in Ascites; Pleural Ascites Drainage. (Eine Neue Operation bei Ascites; die pleurale Ascites drainage). Dr. R. Sievers. München med. Wochenschr. No. 1, 8.

The frequent failures of the present methods of ascites drainage are due to the fact that the artificial communication between the peritoneal cavity and the subcutaneous tissue easily closes up and that the absorbent power of the subcutaneous tissue is insufficent. To obviate these disadvantages Dr. S. establishes a communication between the peritoneal and pleural cavities. The method is as follows: Large incision under left costal arch. Resection of anterior end of tenth rib which is free from pleura. Evacuation of ascites. Examination of left subphrenic space which must be free from adhesions. Incision of peritoneal covering of diaphragm behind the spleen. Temporary tampon of the abdominal wound. Second incision above the eighth rib. Subperiosteal resection of 5-6 cm., of the eighth rib. Pleura is temporarily left intact. Now a piece of aorta which has been taken from a dead body, hardened in alcohol and preserved in formalin, is passed over a large sound and temporarily sewn up over its conical end. The incision in the peritoneal covering is carried through the diaphragm leaving the pleural covering intact. The instrument with the piece of aorta is pushed through this incision towards the chest wound. Under positive pressure the pleura is opened and the pleural covering of the diaphragm incised. The closed end of the piece of aorta is reopened. Circular suture between its free margin and the incision in diaphragmatic pleura. Suture in layers of the chest wound. The abdominal end of the piece of aorta is placed between the parietal peritoneum of the outer wall of the abdominal cavity and the spleen and splenic flexure of the colon. The piece of aorta is shortened as far as nec-

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essary. Closure of abdominal cavity. Advantages: Communication between the two cavities cannot close. Absorbing power of pleural cavity is far superior to that of the subeutaneous tissue of the abdominal wall.

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Med.

ASTHMA, Treatment of

Considerable attention is now being devoted to the etiology, pathology and treatment of asthma. Laboratory tests are being made in an effort to discover the cause or causes. Clinical study is made to ferret out the pathogenesis of the disease. Therapeutic study aims to suggest an etiology by means of the therapeutic test. Asthma is not a simple, plain disease. Its many complexities and treatments add greatly to the problems of fixing a definite etiology and tracing a pathogenesis.

The characteristic sounds emanating from the lungs are ascribed to a large variety of conditions, as follows:

1. Spasm of bronchial muscles. And an atonic or paralytic form—paralysis of circular fibres.
2. Vasomotor neurosis, producing urticaria-like swelling of the mucous membrane.
3. Hereditary neuropathic tendency and vasomotor ataxia.
4. Spasm of the bronchial muscles and inflammatory swelling or vasomotor swelling.
5. Spasm at attack and atonic conditions at intervals.
6. Eosinophilic diathesis, producing a non-inflammatory hyperemia.
7. Exudative bronchiolitis.
8. Anaphylaxis—antigen-anti-body formation, but without protection that should be afforded by the anti-bodies.
9. Allergy or sensitiveness to different food proteins, producing biochemical changes on entering the circulation.
10. Allergy to plant emanation or pollens, producing seasonal asthma—rose cold, hay asthma, etc.
11. Allergy to animal emanation, the blood of some persons containing specific precipitins for the albumin of the animal in question.

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12. Imperfect metabolism, leading to toxemia.
13. Bacterial infection, producing winter asthma.
14. Fatigue toxemia, or fatigue neurosis.
15. Syphilis of the lung.
16. Peribronchial thickening or certain forms of fibrous tuberculosis.
17. Certain forms of tuberculosis with great resisting power on the part of the patient where wear and tear go hand-in-hand with repair.

Which of these conditions are primary and which secondary has not been determined.

Treatment, of course, has been directed to all of these conditions. Antispasmodics of all kinds have been used with great success, although eventually each one loses its effectiveness for the given patient and then recourse must be had to a different one.

Alteratives have been used, with excellent results in many cases, but eventually they too lose their value for the particular case.

Vaccines, phylacogen, serobacterins, etc., have done remarkably well in cases due to or complicated with bacterial infections.

General tonic treatment has done much for many run-down and toxemic asthmatics.

Specific diseases that also affect the lung as well as other parts of the body are promptly relieved by appropriate treatment directed to the disease.

For some years clinicians and laboratory investigators have given considerable time and attention to discovering the relationship of normal and foreign protein and other substances to the etiology of asthma.

The examination now of an asthmatic has gotten to be quite a systematic affair. First is a general laboratory examination of urine

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and sputum, and blood for Wassermann test. Then tests are made for food and pollen sensitiveness. Next autogenous or stock vaccine is used if there is marked expectoration or mixed infection. It is well to use it in any case. In addition to the tests for food and pollen sensitiveness and the use of appropriate remedy, the injection of "foreign" protein (that is, a kind not existing in the human body) is of great value.

Tests for food and pollen sensitiveness are easily made. The pollen testing material is supplied in powder form. The patient should be comfortably seated in a chair with his two arms bared, resting in front of him on a table or other support. The skin of the patient's forearm is carefully cleansed with alcohol. At three different spots about two inches apart the skin is lightly scratched to remove the surface epithelium, but not deeply enough to draw blood. The upper arm is treated similarly. With a sterile applicator of some kind (a sterilized wooden toothpick is used by some) place a small quantity of the pollen powder on one of the abraded surfaces. With another applicator place a drop of one-tenth decinormal sodium hydroxide solution. Be careful in the making of this solution to have it right. A good way is to make a decinormal solution of the sodium hydroxide, and then to ten parts of this add ninety parts of distilled water.

Five of the six abraded spots on the patient's arm are to be used for testing with five different pollens or proteins, and the sixth one is to be used as a control. The proteins are supplied in solution. One drop of the solution is dropped on the abraded spot selected for the test. The sodium hydroxide solution is not used on the proteins in solution. It is only used on the dried pollens. On the control spot nothing is applied or else a drop of distilled water is used. The other arm is treated similarly.

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ASTHMA, Treatment of

When a positive reaction occurs a very irregular ragged area of redness forms around the area of inoculation. It resembles a mosquito bite, with elevation, white crest and erythematous areola. This occurs within five minutes in a positive case, according to Dr. Alexander Sterling, who has done much of this work in Jefferson Hospital in this city. Two layers of sterile gauze are bound on the arms before the patient is dismissed.

By the means given above, ten tests can be performed on a patient at one time. The tests are repeated a week later with ten other proteins. Any number of proteins can be tested on the patient. Among the substances that may be tested with in this manner for possible allergy reactions are ragweed, goldenrod, egg yolk, egg albumin, milk, casein, cheese, herring, beef, chicken, lamb, pork, wheat, corn, rice, potato, barley, cocoa, radish, beet, cabbage, and onion. In addition, tests are also made with horse serum, cat's hair, dog's hair, and horse hair.

In case a positive result is obtained with any of these, desensitization is attempted. This is done by means of a very dilute solution of the agent producing the reaction. Inject hypodermically 5 drops of a 1 to 10,000 dilution of the agent every two or three days, increasing the amount at every third or fourth injection. At the end of two weeks the dilution may be made 1 to 8,000 or 1 to 6,000 and the dose reduced and then raised as before. This can be continued with increasing strength until the patient does not react to a large injection of the full strength solution. Afterward repeat the skin test with this particular proteid to learn if a cure is effected.

After a positive result is secured the patient is only cured of allergy in regard to that particular proteid, pollen or other substance. He may require treatment for a number of them.

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ASTHMA, Treatment of

Sterling has been very successful with the use of the foreign protein. He has injected mustard and rape protein, either alone or mixed. Good results have been obtained, altho the reaction was gotten from a food proteid, pollen, etc.

Drugs also are useful. In the attack adrenalin chloride relieves the spasm. Sterling says use only 1 to 2 minims, that the results will be as good as with 10 minims. That may be true of cases that have not had adrenalin injected previously. But we have had patients that required 25 minims injected hypodermically in order to get relief.

Sterling tried the effect of pituitrin on ten patients, 1 mil being injected in each. The result was a severe paroxysm of asthma. The injection of 1 mil of adrenalin relieved them. This may point to hyperpituitary action as the basis of asthma.

Other drugs that have been injected hypodermically for the arrest of the paroxysm are scopolamine, dionin, morphine, atropine, aspidospermin (one-eighth grain), and quebrachoid. Sterling sometimes has patients drink a glass of hot water every hour for two days a week. He also gives a series of twelve injections of sodium cacodylate, injecting hypodermically 7½ grains every two days. As a sedative he prescribes sodium bromide, 10 to 20 grains; tincture of belladonna, 1 to 2 minims; and Fowler's solution, 5 to 10 drops, in water three or four times a day.

Dr. William A. Swalm uses frequently a mixture consisting of Fowler's solution, 2 drams; Hare's anti-asthmatic elixir, 4 drams; glykeron, 4 drams, and elixir lactopeptine to make 4 ounces. He gives a teaspoonful every three hours.

Another useful combination is a pill composed of lobelin, 1-128 grain; apomorphin, 1-64 grain; strychnine, 1-128 grain; and hyoscine sulphate, 1-2000 grain. One pill may be administered every

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fifteen minutes until relief occurs, then continued every three hours as needed.

Benzyl benzoate is an antispasmodic, given in one-grain doses in solution. It is giving good results in some cases.

Dr. Benjamin Ulanski gave one patient auto-condensation treatment, using a pad on front and back of chest. The patient was relieved for six months.

Aspirin and all other salicylates are contraindicated in asthmatics, altho they can stand 10 grain doses.

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Med.

ASTHMA: Its Anaphylactic Nature and Treatment

La Riforma Medica, Naples, quotes La Presse Medicale as saying, that the first observation of practical interest in this aspect of the pathogenesis of asthma, was in the case of a dealer in sheep who had an asthmatic seizure whenever he inhaled the exhalations of the sheep. Widal and his collaborators, Lermoyez, Abrami, Brissaud and Joltrian, agree not only as to the susceptibility to the exhalations of the sheep, but also to an assemblage of blood vascular phenomena, which precede the asthmatic crisis, consisting in leukopenia, modification of the coagulability of the blood, and lowering of pressure.

Later Cordier published a case of alimentary asthma due to the ingestion of meat.

In the past few years the American investigators, among them Walker, Frost, Rackelman and Cooke, have studied the susceptibility of the skin in asthmatics to protein by the intradermic method. In this conception the asthmatic patient should be an individual sensitive to some protein. The protein may enter the system in three ways, by ingestion, by inhalation or by infective processes. It may be in articles of food, as eggs, flesh, fish, flour, etc.; in the hair, perspiration and desquamation of animals, in wool, in the feathers of birds, and finally, it may be of bacterial origin.

To ascertain toward what protein an individual is sensitized, only a slight scarification of the skin is required, to which is applied a few drops of the solution of the protein to be tested. After half an hour if the reaction is positive there should appear at the point of inoculation a whitened area surrounded by an aureola of urticaria.

In America desensitization is practiced by means of vaccination, which does not require any special technic, simple injection of

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the protein under the skin of the forearm is all that is required. A small dose should be used at first, gradually increasing until the skin reaction becomes positive. This is said to furnish immunity over a period of two years. Besides the vaccinotherapy, experiments have been made in auto serum therapy (Widal). However the vaccination therapy is regarded as most successful.

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BLOOD PRESSURE

Practical Manual Continuous U. S. Bureau of Research, Washington and Commercial Research Bureaus
W. W. Blackman, M. D., Atlanta.

Definition: The term Blood Pressure is synonymous with arterial tension and means the tension of the blood within its containing arteries.

Mechanism: The elements entering into blood pressure are:
The heart output.
The elasticity and tone of the arteries.
The peripheral resistance.
The blood volume.

Since the vis-a-tergo for blood movement is afforded by the heart's contractions, the functional effectiveness of that organ is a factor of first importance.

The arteries constitute a distensible reservoir for receiving from the heart the intermittent discharges of blood and maintaining, by distention and recoil, a continuous pressure of blood upon the capillaries. Arterial rigidity or construction increases while vaso-dilatation decreases the pressure, due in each instance to corresponding peripheral resistance to blood flow.

Variations in the total amount of blood in circulation unless relatively great or sudded, are not important as affecting blood pressure, being compensated by vaso-motor action. The viscosity of the blood is no longer given much consideration as an element in pressure production.

It is known that epinephrin, the internal secretion of the adrenal glands, acts upon the vaso-motor mechanism of the arteries exerting the function of regulating, in greater or less degree, the blood tension.

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THE MEDICAL INTERPRETER

BLOOD PRESSURE

This from the pen of Osler: The blood pressure, the tension or force with which the blood circulates, depends upon five factors: (1) The heart pump supplies the force; (2) the elastic coats of the large arteries store and convert an intermittent into a continuous stream; (3) the small arteries act as sluices or taps regulating the control to different parts; (4) the capillary bed is the irrigation field over which the nutritive fluid is distributed; and (5) the drainage system is represented by the veins and lymph channels.

The Beginnings of Pressure Estimations. The earliest efforts that were successful in this field were those of Marey, in 1876, who promulgated the principles upon which blood pressure is measured today. Subsequently the instruments devised by Bosch and Potain came into use. It was Riva-Rocci who produced the convenient and effectual pneumatic arm-band and pump for compressing the brachial artery. The Bosch apparatus consisted of a small rubber bulb filled with water connected with a mercurial manometer. The bulb was pressed upon the radial artery until the pulse was just obliterated and the pressure read off the manometer. Bosch later replaced the mercurial with the aneroid manometer. Potain then substituted air for water in the Bosch method.

Riva-Rocci's air-bag, about two inches wide, for encircling the arm and compressing the brachial artery, is the prototype of the present day device and its values were registered by means of a mercury column in an upright capillary tube graduated in mm. This instrument gave readings which were found to be much too high and which were corrected by adopting a cuff of 2½ to 3 times greater width. While the mercury column is still clung to by many as being a gauge of greater accuracy in pressure determinations, the air chamber and dial registering device as typified in American instruments by those of Faught and of Taylor Brothers the ones in general use. These are graduated to correspond to mm. of mercury.

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BLOOD PRESSURE

Phases of Blood-Pressure Readings

This subject should be touched upon before going into a discussion of the technique of blood-pressure determinations. The phases of a completed reading are the systolic, diastolic and the pulse pressure The systolic or maximal pressure within the artery is reached at the height of systole of the heart. It depends upon the contractile power of the heart and the peripheral resistance it has to overcome. The peripheral resistance is regulated by the degree of contraction of the vessels and their distensibility. The degree of contraction of the vessel wall in turn depends on the vaso-motor center, while its distensibility is a problem of its degree of tone and its histological integrity.

The diastolic or minimal pressure is the lowest phase. It occurs at the end of systole. Descent to this point is due to the escape of the blood through the capillaries. Whereas the systolic pressure approximates the intraventricular tension in systole, the diastolic pressure represents the peripheral resistance. *This measurement of vascular resistance to blood flow is not solely of that encountered in the distribution of the brachial artery.* If increased resistance is met in the renal or hepatic arteries, pressure will be increased in the brachial and other arteries, near or remote.

The pulse pressure is the excursion from systolic to diastolic or the difference between these. It is the increment of pressure during ventricular systole and represents the driving force of the blood. In a limited sense it is a measure of the circulatory effectiveness.

Considerable stress has been laid by many writers upon the importance of diastolic pressure in addition to the systolic and pulse pressure. L. F. McKenzie (Med. Rec.) refers to it in fact as the fundamental pressure upon which blood pressure readings should be based.

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BLOOD PRESSURE

"The diastolic pressure is more constant and less influenced by the emotions than the systolic pressure. Furthermore, it is probably a more accurate index of high or low tension than the systolic pressure, because, as stated, it measures the amount of peripheral resistance. Moreover, it is very necessary accurately to determine the diastolic blood pressure, because the pulse pressure can thus be obtained by subtracting the diastolic blood pressure from the systolic. The pulse pressure, thus determined, represents the actual head of pressure which is forcing the blood to the periphery. "A study of these three landmarks in blood pressure reading gives us the desired information concerning the circulation in both the heart and peripheral blood vessels. The therapeutic importance is plain." Warfield (Illinois Med. Jour., N. Y. Med. Jour.).

The formula of the normal relation of the systolic, the diastolic, and the pulse pressures is 3:2:1, for example, systolic 124, diastolic 82, pulse pressure 42. Faught (Med. Rec.). If these relationships become markedly abnormal disease is developing and imperfect circulation is in evidence with danger of broken compensation occurring sometime in the future. It should be remembered that the diastolic pressure represents the pressure that must be overcome before the aortic valve opens while the pulse pressure represents the power of the left ventricle in excess of that. A high diastolic pressure is of serious import to the heart; one as high as 100 is significant of trouble and one over 110 is a menace.

The writer experimentally and clinically fixes the third phase (that of the change of sound to a dull murmur before disappearance) as the criterion of diastolic pressure. A high pulse pressure means a large output of blood from the ventricle. The very high pulse pressures occur in only two diseases: aortic insufficiency and the large hearts of chronic nephritis. A high systolic will return to normal

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after the stimulus is removed, if the diastolic has not been altered. A gradually rising diastolic is of more importance than a rising systolic. Louis M. Warfield (N. Y. Med Jour.).

Use of the Sphygmomanometer. With the patient lying or sitting, the lower part of the upper arm is lightly fitted with the arm bag. Air is then pumped into it until, by compression of the brachial artery, pulsation below the cuff is cut off. The air is then gradually released from the pneumatic cuff, and the pressure readings are made, either by the palpation or the auscultation method.

Palpation Method. As compression in the cuff falls the palpating finger upon the brachial below or usually upon the radial artery, notes the first return of pulsation. Simultaneously the eye observes the reading upon the dial or mercury column giving the *systolic pressure* in mm. hg. As the pressure is now allowed to continue slowly to fall a point of maximum oscillation of the recording instrument will be reached, the bottom reading of which is the *diastolic* pressure. This point will be found to correspond with that at which the palpating finger observes the transition from a small to a full volume pulse.

The most satisfactory and probably the most trustworthy determination of the systolic pressure is by the palpatory method, while for the diastolic pressure either the change of sound or the disappearance of all sound should be taken as the criterion, depending upon the accuracy of the determination in each individual case. The point selected should be recorded and always used in the future work with the same case. The systolic pressure is unquestionably of much more value than the diastolic, and contrary to general opinions, the relative range of variation in the normal subject is wider in the diastolic than the systolic. The pulse pressure is subject to still greater variations, and several factors beside the volume of blood ejected from the heart

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influence it, e.g., vasoconstriction and dilatation, either generalized or local. The systolic pressure is certainly of value in arterial and renal diseases, cerebral pressure, the toxemias of pregnancy, Addison's disease, and to a less extent in the diagnosis of aortic insufficiency.

A very valuable use is in the early discovery of pulsus alternans, which can often be brought out by careful adjustment of the cuff pressure so as to cut out every alternate feeble beat, even where the alteration is not otherwise appreciable by the finger. E. S. Kilgore (Lancet).

Auscultation Method. By this method the examiner relies upon what is heard with a stethoscope placed over the artery just at the lower margin of the cuff.

The cuff is adjusted and the bell of the stethoscope is placed over the artery just below it. Compression by the cuff is raised until pulsation sounds below are obliterated. The air pressure is now slowly released and when the first pulsation to make its way through registers itself as a thump in the stethoscope, the *systolic* reading is made.

Gradually allowing the air compression to fall, the audible pulsations continue with increasing, then decreasing, distinctness, then disappear. At the instant of disappearance is observed upon the mercury column or aneroid the *diastolic* pressure.

The auscultation method has greatly facilitated blood pressure determinations, rendering that of the diastolic as easy and accurate as that of the systolic.

Five phases of sound are recognized during the lowering of the air pressure from the obliteration point as follows:

1. A clear, sharp sound or click, the index of systolic pressure.
2. A murmur of variable duration replacing the above.
3. A clear, usually loud and snappy sound, replacing the murmur.

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BLOOD PRESSURE

4. A transformation (usually sudden, at other times more gradual) of the clear, loud sound into a dull one, the index of diastolic pressure.

5. The disappearance of all sound.

In the auscultation method it is largely a question of the physics of fluids, e.g., the artery is constricted by means of the pneumatic cuff; below it there is no arterial flow, and the vessel walls are in a semi-relaxed condition. The blood pressure is lowered in the cuff gradually until the heart has power enough to drive some blood into the relaxed vessel beyond. The sudden flow of blood into the relaxed vessel sends the wall into vibration, and a loud, clear thump is heard which gives the systolic pressure. In making the diastolic estimation there is again a physical condition of a fully expanded artery above the pneumatic cuff, a constriction under the cuff, and an enlargement below. Fluid passing from a large tube through a constriction into a large opening makes a murmur, exactly what takes place, and when the caliber of the tube is uniform, or, in other words, when the diastolic pressure is able to overcome the constriction of the cuff, there will be no longer any sound. Nicholson (Sajous, Analytic Cyclopedia, 1920).

C. F. Judson and Percival Nicholson (See N. Y. Med. Jour.) made 2,300 blood pressure observations upon children whose ages ranged from 1 to 14 years. They found the auscultation method superior to the palpation method, and the modification of the Erlanger apparatus to be the best. The gradual increase in the blood pressure takes place up to 13 years of age. From 10 to 14 years, at puberty, there is a rapid increase in pressure, owing to the great increase in the size of the heart at that time. The variation from four years to puberty is less than 8 mm. and the total rise from 4 to 14 years of age is 14 mm. The systolic pressure is of more importance than even the

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diastolic or pulse pressure, although in certain heart lesions the diastolic pressure is extremely important in establishing the prognosis.

In children, estimated by the auditory method which the writers consider simple and determinate, the average systolic pressure is 108.1, the average diastolic pressure 72.4, and the average pulse pressure 35.7mm. mercury. The cardiac output is small in them; besides, the capillary system to be filled is very limited as compared with the adult. Yet the systolic pressure is only slightly lower in children than in adults. The average diastolic level, on the other hand, is decidedly higher in children than in adults; this is the main cause of the considerably smaller pulse pressure in children—35.7 mm.—as compared with 46 mm. in adults. By the tactile method the average systolic pressure was 105.7 in children as compared with 108.7 in adults, while the range was 125-84 in the former and 132-92 in the latter. By the auditory method the range of systolic pressure was 130-90 in children and 135-92 in adults, while the range of diastolic pressure was 90-50 in the former as compared with 82-50 in the latter. In children the relation of pulse pressure to systolic pressure was 1:3 and to diastolic pressure 1:2, while in adults this relation was 1:2.7 and 1:1.6 respectively. Melvin and Murray (Brit. Med. Jour.).

In the aged, 100 women and fifty men examined by the writer, the systolic and pulse pressures increased to the age of 85 and then decreased. The diastolic pressure did not vary much after the age of 70. The blood pressure was higher in women except after the age of 90. There were a few who had very high blood pressures without symptoms. They were going about their everyday duties in apparently perfect health. Bowes (Jour. of Labor. and Clin. Med.).

The beginning of regular, rhythmic snapping sounds is the best criterion point for use in measuring the systolic pressure. The criterion for measuring the diastolic pressure is the lowest point where

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the snapping sounds are heard, or where they just cease. The auditory method of measuring blood pressure is more satisfactory than the palpatory or sphygmographic methods. Brooks and Bleile (Jour. Amer. Med. Assoc.).

"Diastolic pressure is to the systolic pressure, under normal conditions, as 3 is to 4. This gives the pulse pressure as one-fourth of the systolic reading. Diastolic pressure has as yet received comparatively little attention because of the difficulty of ascertaining it, yet it is a factor of great importance because by its amount and by the difference between it and the systolic pressure we obtain valuable data in regard to the strength of the heart and condition of the arterioles. Pulse pressure depends on the pulse rate. If the pulse is slowed more time is allowed for the blood to run through the arterial system during diastole. Diastlic pressure will be lowered and pulse pressure increased. The reverse also applies.

"A weak heart will not raise tension as rapidly as a strong one, and the time between the end of each systole and the next will be shorter and the pulse pressure lower. In a stronger heart the interval between systoles is longer and there is a larger pulse pressure.

"Now turning to the blood vessels, we find when they are hypertonic the diastolic pressure remains high, giving a small pulse pressure, and vice versa.

"A low systolic pressure with a large pulse pressure shows dilated vessels and a probably strong heart. A low systolic pressure with a slight pulse pressure indicates the heart itself is weak; in addition, there is probably some dilatation of the vessels, though a feeble heart with normal vessels could give these signs.

"If there is a high systolic pressure and a correspondingly high diastolic pressure, giving a normal pulse pressure, we may assume there is a normal balance between heart and vessels, and a compensatory condition is present.

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BLOOD PRESSURE

"Thus pulse pressure is of the greatest value in determining the condition present, whether mainly due to heart or arteries, and is most important in relation to treatment. By observing the changes in pulse pressure of our cases under treatment we obtain the most accurate idea possible of the results that are being attained; far more so than when we utilize the systolic pressure alone." Lauder Brunton.

Factors of Variation in Pressure Readings

To eliminate, so far as possible, sources of error in comparative pressure estimations in the given individual it is necessary to observe uniformity in the conditions under which they are made.

If the sitting posture is selected for one reading, the reclining should not be used for the next. In the horizontal position systolic pressure is found to be 8 to 10 mm. higher than in the sitting posture. The diastolic pressure is relatively more increased than the systolic in the horizontal, thus decreasing pulse pressure result.

Attention has been called to the importance of the *arm band* being adjusted upon the *same level as that of the heart.* In the upright position, owing to the effect of gravity on the column of blood, if the cuff is placed above the proper level the reading will be too low and if placed too low the reading will be in error in the other direction.

Moderate exercise increases, while *fatigue* decreases, both systolic and pulse pressures.

Report of observations made upon 500 applicants for aviation service. The readings were made with the men recumbent, standing, and after an average of 1,600 foot pounds of work in 5 seconds. The average was 24.2 years and the average readings in recumbency: pulse rate, 85.4; systolic pressure, 127.7; diastolic, 84.1; pulse pressure 42.2.

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After exercise the averages showed characteristic responses. The pulse rate averaged 112; systolic pressure, 145.4; diastolic, 90.6; pulse pressure, 54.1. B. Smith (Jour. A.M.A.).

After meals there is a moderate rise in systolic and pulse pressure and in pulse rate. Weysse and Lutz (Am. Jour. Phys., Vol. 37) found this increase in pressure to be 8 mm. hg.

Transient *emotional states* are capable of distorting pressure determinations. Anxiety, pain and anger are mental influences which increase by vaso-constriction, both systolic and, to a greater extent, diastolic pressure. Muscular relaxation should be secured in every instance for these reasons.

Take all readings on the same patient at the same time of day, preferably midway between meals. Have the patient in a comfortable position, with muscles relaxed, best reclining, but in any case make all subsequent observations in the same postion. Exclude all excitement, and see that patient is mentally composed and breathing quietly. Make the determinations as rapidly as possible. If the above precautions are observed, from a clinical standpoint there will be no important error in the pressure values, providing the apparatus is accurate and the auscultation method properly employed. Nicholson (Sajous' Analytic Cyclopedia, 1920).

Humidity. One of the most noticeable effects of atmospheres of comparatively high humidity is on the vascular system, showing a lowering of blood pressure. This is particularly evident when the atmospheric temperature is high. Many systolic readings of 85 to 90 mms. were recorded. In each case a subsequent drop in temperature and humidity brought about a rise to a normal of 120 and 130 mms. The diastolic was not so greatly affected as the systolic. Too much emphasis cannot be laid upon the fact that every blood pressure reading, to be exact and to give us the fullest amount of information

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should be checked against the reading of a hygrometer. No applicant for insurance should be accepted or barred when his blood pressure is near the border line without a knowledge of the atmospheric moisture prevailing at that time, as it may cause a difference of many millimeters. The relative humidity of the air is measured by computation from the simultaneous readings of a dry bulb and a wet bulb thermometer. The hygro-autometer, made by the Taylor Instrument Co., is a simple and inexpensive instrument which makes these readings and computations.

High Altitudes have not been found to aggravate hypertension, as commonly believed. That the blood pressure will be raised as the atmospheric pressure becomes less is regarded as fallacious by Schrumpf, who reported that normal pressure is unaffected by an ascent to 2,000 meters.

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BLOOD PRESSURE

High Blood Pressure

Lowering of the death rate during the past forty years has depended upon control of the acute infectious diseases and the lessening of deaths among children and young adults. Sanitarians are alive to the fact that the death rate for the age periods above 40 has actually increased, due in the main to diseases of the heart, arteries, kidneys, and to cancer.

By as much as the proverbial value of prevention exceeds that of cure, does the importance of study of the causes of disease surpass that of its manifestations, its results or its treatment. Clinical classifications should, therefore, be etiological whenever possible, to emphasize above all things the point of attack upon disease. However, owing to the complexity of the problem of assigning definite causes, in our present knowledge, covering all cases of abnormal blood pressure, your writer elects to touch upon the wide variety of factors that are, or have been, justly or unjustly, held responsible in its etiology.

Nervous Hypertension. Under this head falls a more or less well defined group of cases of high tension without signs of arterial, renal or toxic disease—what Clifford Albutt calls hyperpyesis. The blood pressure is constantly high—above 180—without discernible organic cause. Osler observes that it is met with most frequently in keen business men, who work hard, drink hard and smoke hard; and that it predisposes to arterio-sclerosis. He does not share the belief that adrenal hypersecretion is the cause.

Bishop outlines what he calls a "composite picture" of the prevalent case of this type. A man enters mature life healthy in body and mind. He is a worker, and spurred on by success, little by little attains a position of importance. New burdens are laid upon him. He works unceasingly without those relaxations that attract men of lighter turn of mind. Through the overflowing of mind-strain, blood

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vessel tonicity becomes exaggerated and the blood no longer circulates with ease. The heart works harder and hypertrophies to carry on its work. High blood pressure results. Fibrous changes ensue in the arteries subjected to this sharp rise of pressure at every systole as a matter of defense.

We cannot lay too much stress upon the mere effort one puts forth in meeting the vicissitudes of life as an etiological factor in circulatory diseases. It is quite popular in our time, and, as we know, quite gratifying to our patient, especially if that patient be a member of the medical profession, to charge the affliction up to overwork and noble and heroic burden bearing; but, if we will be honest with ourselves, we will have to admit that many times the recreation indulged in after the performance of a fair day's work is more responsible for the disease a man may have than is the work itself; or, instead of the recreation after work, it may be the indulgence of some habit before, during or after work, or failure to obtain physiological rest after what may have been a very strenuous but physiological exertion. O. M. Hayward (Jour. Med. Assoc., Georgia).

Pain causes increased blood tension in the arteries, especially where the splanchnic nerves are involved and the splanchnic vessels are constricted.

Toxic Hypertension. Every physician sees frequent instances of hypertension attributable to toxemias and remediable by measures which are prophylactic and eliminative with reference to such cause.

Lead is a poison which, with the colic, regularly produces vascular spasm and hypertension. Chronic plumbism is a dependable but relatively rare cause of this condition. F. S. Billings has called attention to the fact that lead may cause gout and contracted kidney—both precursors of arterio-sclerosis. In either of these ways it may indirectly lead to heightened pressure.

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BLOOD PRESSURE

Alcohol has been widely believed to be an important toxic agent in this connection, by reason of its irritation to the arterial intima. This assumption is the subject of dispute, there being great difficulty in determining which of several factors may have been the most important causative element. Reckoned by the test that chronic hypertension is a precursor of arterio-sclerosis, chronic alcoholism, is a cause of hypertension, should consistently result in arterial degeneration. Cabot's findings are widely quoted as disproving this.

Only 6 per cent. of 283 cases of chronic and excessive alcoholism under 50 years of age showed any evidence of arterio-sclerosis. Of forty-five cases of this affection examined by the author at the Massachusetts General Hospital, only 13 per cent. gave any history of alcoholism. Of 656 autopsy cases of arterio-sclerosis only ninety-five, or 145 per cent., were under 50. Out of these ninety-five cases under 50, in which arterio-sclerosis was found post-mortem, only 21 per cent., and if the cases complicated by chronic nephritis are excluded, only 17 per cent. appear to have consumed alcohol in notable excess. Richard Cabot (Jour. Amer. Med Assoc.).

The oxidizing power of the body, which is definitely limited, is heavily drawn upon by the presence of alcohol in the tissues and this damages to a definite degree the capacity for oxidizing other substances, which may be irritating poisons derived from food, bacteria, or the tissues themselves. The extent of this reduction in oxidizing power amounts to one-twelfth of the daily oxygen intake for an amount of alcohol equivalent to that contained in two glasses of beer. O. M. Haywerd (Jour. Med. Assoc., Georgia).

Nicotine is generally recognized as a toxic agent of importance in the production of hypertension. The published experiments of D. C. Brink, a Y. M. C. A. physical director, are corroborative. He found that his subjects, after quietly smoking three cigarettes, showed

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a rise of 25 mm. in blood pressure and an increase of 25 per minute in pulse rate, both effects lasting from thirty minutes to one hour. The increase was greater and the return to normal less rapid in habitual smokers than in non-smokers—a significant fact.

It is held that nicotine is an excitant to the supra-renal gland and produces an increased output of its blood pressure raising secretion. Isaac Adler, Gouget and Frankel-Hochwart and others have demonstrated by animal experiments that nicotine can produce sclerosis of the small arteries, atheromatous plaques and thickening at the base of the aorta and various vascular degenerations. In the presence of the figures showing that, in addition to the pipe tobacco, chewing tobacco and snuff, twenty-five billion cigarettes and ten billion cigars are consumed annually in the United States, it is apparent that nicotine merits consideration in this connection.

The effect of tobacco in cigarette and in cigar smoking was found to be the same. There was an average increase in pulse rate of 18 beats per minute. Whereas the risk from any elevation in blood pressure increases greatly the higher the initial pressure in the patient, it is undesirable for anyone having a constant systolic pressure much above 200 to smoke. Again, smoking is equally undesirable for anyone having a constant initial pressure above 160 mm. when the use of tobacco is found uniformly to produce a considerable rise in blood pressure. Thompson and Sheldon (N. Y. State Jour. of Med.).

T. C. Janeway (Boston Med. and Surg. Jour.) regards the exogenous toxins of tobacco, alcohol, tea and coffee as being of doubtful importance in the production of hypertension and cardio-vascular disease. Toxic disturbances exist, evidenced for the most part by disorders of rhythm. He has tabulated the histories, as to tobacco, of 285 men with hypertension. Certainly no important influence of tobacco can be seen in these figures.

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BLOOD PRESSURE

Intestinal Toxemia is a fruitful cause of high pressure, acting through irritation to the intima of the arterioles and the vasomotor center and producing toxic angio-spasm. The subject of this affection may congest his viscera by habitual alimentary overindulgence, with the attendant load upon splanchnic blood flow and with toxic bi-products of defective digestion. He most often exceeds his capacity for the prompt and vigorous digestion of proteins, converting his colon into a fulminating tube for putrefactive processes. The resulting pressure elevation will respond to eliminative and dietetic measures if the pulse violence has not robbed the delicate arterial coats of their elasticity and induced degenerative changes in the arterioles including those of the kidneys.

A. Eustis (So. Med. Jour.) bases on personal records of 300 cases of high arterial blood pressure observed, the following conclusions: High blood pressure is probably caused by a toxemia, probably from parahydroxylphenylethylamine, which is absorbed from the intestinal canal, where it is formed by the putrefaction of tyrosin. In cases of high blood pressure elimination is indicated by catharsis and copious use of water, unless the heart muscle is not functioning properly. A diet composed of substances yielding little or no tyrosin on digestion is indicated. The diet of the patient with high blood pressure is as important as the medicines prescribed.

Arterio-Sclerosis will, in the majority of cases, show heightened blood pressure; in most cases before thickening of the vessels can be detected. It may happen, however, that in many cases of even well-marked sclerosis the pressure is not raised. This may be because the disease is localized to a palpable part of the arterial system or because the heart muscle is in decompensation. Localized sclerosis of the splanchnic vessels seems to give rise to more pressure increase than the same amount of disease elsewhere.

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THE MEDICAL INTERPRETER

BLOOD PRESSURE

In the majority of patients with so-called cardio-renal disease, I am convinced that it is essentially a disease of the circulatory system, involving the kidney through its vascular apparatus and sometimes sparing it entirely. The behavior of the blood pressure in these patients, when seen early, strongly suggests that the hypertension is dependent upon an exaggerated vaso-constrictor irritability, and that the development of the lesion in the arterioles comes later. Were I to speculate, I would venture the opinion that a chronic intoxication will eventually be proved underlying the condition; but whether the poison originates in disturbed metabolism, in deranged or excessive function of a gland of internal secretion, or otherwise, I should not even hazard a guess. T. C. Janeway (Boston Surg. and Med. Jour., v. 174, p. 925).

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BLOOD PRESSURE

Infections have held a place of debatable importance in the etiology of arterial changes characterized by high blood pressure. Syphilis, typhoid, diphtheria, smallpox, measles, and scarlet fever have been credited with producing arterio-sclerosis. However, in an analysis of 3,894 cases in Osler's wards, W. S. Thayer did not feel justified in drawing any conclusions that acute infectious diseases played a part in the development of arterio-sclerosis further than to say that typhoid fever plays some causal part.

One of the most careful clinical studies, that made by Thayer of the vascular complications and sequels of typhoid fever, showed that the radial arteries were far more frequently thickened, and the average systolic blood pressure was higher in every decade in patients with a history of previous typhoid fever.

I have tabulated the histories of my series of hypertensive patients previously reported with reference to the incidence of past infections:

	No. Invest.	Positive Hist. No.	Per Cent.
Pyogenic infections, surgical, etc....	312	71	18.4
Typhoid Fever	384	57	14.8
Pneumonia	379	49	12.9
Arthritis	374	46	12.3
Scarlet Fever	377	37	9.8

The outstanding fact in this group is the frequency of typhoid as compared with pneumonia (the author gives figures showing pneumonia approximately three times as prevalent as typhoid). Yet more of my patients had passed through typhoid fever than through pneumonia.

Faber's conclusion is, that the greater the number of illnesses an individual has survived, the more arterio-sclerosis he is likely to develop. T. C. Janeway (Boston Med. and Surg. Jour.).

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THE MEDICAL INTERPRETER

BLOOD PRESSURE

Low pressure is the rule during all acute infectious diseases excepting meningitis and possibly nephritis. High pressure in any acute infection requires elimination of meningitis and nephritis as causes.

The writer has met with an imposing number of hypertensive patients in whom intestinal toxemia was the obvious cause. The patient relates suggestive head and digestive symptoms, his appearance points to over-feeding and toxicity, indicanuria and foul stools exist and any increase of constipation aggravates his symptoms and pressure. Excessive meat eating is uniformly admitted. In the South, hog-killing time is the "open season" for these cases.

The neutralization by the liver of the absorbed poisons of unwholesome bacterial flora in the colon is one of the onerous functions performed by that organ upon the portal blood. Among the many very interesting experiments made and published by Pawlaw is one in which the portal blood is short circuited past the liver. It was found that such dogs, after recovering from the operations, would invariably die within three days on a diet consisting largely of flesh, while they remained in good health for an indefinite period if fed on a carefully selected non-flesh dietary.

The toxemia of *pregnancy,* occurring in the later months, is first heralded by rise of blood pressure; that in the early months, associated with vomiting, by decline in blood pressure.

J. C. Hirst says a blood pressure below 125 mm. should be disregarded; 125 to 150 mm. needs careful watching and moderate eliminative treatment. Over 150 mm. needs active eliminative treatment and will, especially if there is a tendency to climb higher, require induction of premature labor.

Blood pressure in the last half of pregnancy associated with albuminuria and eclampsia is invariably high.

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The role of *syphilis* is not widely believed to be an important one in the production of hypertension. While this infection is potent for production of arterial degeneration, the process is prone to localization, as in the aorta, coronary arteries or the circle of Willis. General affection of the small arteries and arterioles is regarded as rare.

Current teaching, surely well represented by Osler, makes syphilis "one of the most important single causes" of disease of the small arteries. This, however, is usually due to the inclusion of syphilis of the aorta in the general category of arterio-sclerosis, a practice which should be abandoned. In a recent article Riesman says, "Taking arterio-sclerosis cases by and large, I may say that syphilis is the most frequent cause of the uncomplicated type of the disease." But arterio-sclerosis almost inevitably involves many complications and he is certainly confusing arterio-sclerosis with essential hypertension. Herxheimer's authoritative review shows the occasional report of true syphilis of the larger peripheral arteries and of widespread arterial lesions, but these belong to the exceptions. No facts have yet been brought forward to prove that syphilis is of more importance than other chronic infectious diseases in the etiology of ordinary arterio-sclerosis.

When we turn to the particular question of the role of syphilis in hypertensive cardio-vascular disease in the white race, the very low percentage of positive Wassermann reactions, at the most 3.5 per cent., compared with the figure for the whole number of white patients, 8.8 per cent., seems to give an effectual answer in the negative.

My conclusion is, that no evidence has been brought forward to place hypertensive cardio-vascular disease in the category of the direct results of syphilis and that syphilis plays an indirect role, if any, in its causation. T. C. Janeway (Boston Med. and Surg. Jour., Vol. CLXXIV., No. 26).

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BLOOD PRESSURE

Focal Infections bear an as yet ill-defined relation to our subject. Instances are not lacking in which very high pressures have been quickly reduced by the elimination of dental or tonsillar foci of pus organisms. Such foci, through metastases or bacterial toxic emanations show baneful effects upon heart muscle, endocardium and kidneys. The mechanism, irritative or compensatory, through which they seem to act in the production of certain cases of hypertension is not clear.

Salt Retention. Allen, Frederick M. (Jour. A. M. A., Vol. 74, 652) says, "any practitioner who will conform his treatment to one reasonable and definite condition, namely, the necessity of the organism to force a filtrate of water and dissolved substances through a damaged and partly blocked glomerular filter, can readily demonstrate for himself the compensatory element in hypertension, by observing the fall of pressure and the relief of some attendant symptoms when proper diet reduces the quantity of this filtrate to a minimum. The simple precedure of salt and water restriction in some cases is followed by rapid improvement similar to the alleviation of the thirst and polyuria after a fast in diabetes.

"Many clinicians have been using a more or less salt free diet in the treatment of hypertension cases, particularly those with nephritis and edema. While the French school, beginning with Widal, Ambard, Combe and others have devoted great consideration to the role of the chlorids, very little attention seems to have been paid to the chlorid retention theory in America. Our clinicians have worked almost exclusively on the toxin hypotheses—first, protein intoxication, alcoholism, intestinal auto-intoxication and lately that of focal infection. Nearly all treatment has consisted of rigid protein restriction, elimination and rest coupled with drugs, electricity, etc. Fluid is restricted only in edema and very little has been written about chlorid restriction.

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BLOOD PRESSURE

"In some cases no rigid fluid restriction is necessary, in fact it may be inadvisable in the beginning of treatment in cases where there is much salt retention and moderate flushing may help eliminate the excess salt and nitrogen, but the prolonged use of excessive fluids with salt restriction may lead to edema and cardiac failure.

"When renal function tests show nitrogen retention there should be a restriction of protein in the diet, but the hypertension is affected only through the salt and water functions. No pressure should be considered irreducible until the daily *chlorid excretion* has been reduced to practically zero. Some salt is necessary in a permanent diet. About 2 gm. seems to be sufficient for normal persons. That for nephritis will vary. Cases with severe nitrogen retention may need more for its diuretic effect to prevent uremia."

Your writer considers the present researches of Allen to be of singular value. It is to be hoped that he will establish his contention and that he will simplify its therapy in the practical way in which he did that of diabetes. He presents a table showing the effects of dietetic treatment in twenty cases of hypertension. In Case No. *2*, having a phenolsulphonephthalein excretion of *54.5* in two hours, the plasma chlorids were reduced from *640* mg. to *588* mg. per 100 cc., the blood urea was reduced from *27.1* mg. to *20* mg. per 100 cc., the blood pressure from *215-170* to *134-70*. In Case No. *14*, having a phenolsulphonephthalein excretion of *5* in two hours, the plasma chlorids were reduced from *648* mg. to *537* mg. per 100 cc.; the blood urea from *1.34* mg. to *42.2* mg. per 100 cc.; and the blood pressure from *214-170* to *140-100*.

Relation to Kidney Disease. A constant blood pressure over 170 mm. is held to be suggestive of chronic intestitial nephritis, even in the absence of albumin and casts. Nycturia, an excess of night urine over the day output, and a large twenty-four hour quantity

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of pale, low gravity secretion is the typical picture. This is characteristic of the arterio-sclerotic kidney. The systolic pressure may rise to 250 or even 300 mm. and the diastolic to 140 or even 170 mm., giving a large pulse pressure. Warfield considers the cause to be some poison elaborated by the diseased kidney and absorbed into the general circulation where it acts on the arterial musculature.

It is possible that there are two groups of cases which we may designate: primary and secondary.

In the primary group the kidney disease antedates the sclerosis of the arteries, and the sclerosis is most probably dependent on the constant high tension. This group occurs for the most part in young and active middle aged people.

In the second group the kidney changes are apparently due to the general arterio-sclerosis which, affecting the kidney vessels, causes changes leading to atrophy and subsequent fibrous tissue growth in scattered areas. In these cases there is more apt to be hypotension—they are the product of senile processes. Warfield, Louis M. (Arterio-sclerosis, 2nd Edition).

The association of chronic renal disease and permanent hypertension leading to hypertrophy of the heart, to thickening of the large arteries and the eventual development of arterio-sclerosis, terminating frequently in myocardial insufficiency or the rupture or occlusion of a cerebral artery, has been a commonplace of clinical and pathological observation since its first description by Richard Bright. I would say that only in the minority of cases should the disease be thought of as primarily renal, and the circulatory disorder as secondary thereto. Of 379 private patients investigated for this point, only sixteen, or 4.2 per cent. of those with hypertension had ever suffered from *acute nephritis* and of the 320 hospital cases, but three gave such a history. T. C. Janeway (Boston Med. Jour., Vol. 174, No. 26).

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BLOOD PRESSURE

As regards hypertension, an analysis of 805 patients made by the writer showed that about sixty-eight per cent. were between forty and sixty-nine years of age, the greatest number occurring between fifty and fifty-nine. 72.8 per cent. of these had definite signs of chronic nephritis. Albumin is usually to be found at some time in these cases and, if persistently absent, the cause of the high pressure is generally cardiac or vascular and not renal. Cadbury (Archives Int. Med.).

Klinkert (J. A. M. A. 1252-73) in a discussion of the causes of hypertension and whether of kidney origin or not, cites his experiences and findings in twenty-five carefully studied cases. These patients had all come to him complaining of angina pectoris, dyspnea or other symptoms of high blood pressure but relating none that called attention to the kidneys which were apparently sound. But the ureo-secretory coefficient determined by Ambard's coefficient told an entirely different story. The Ambard index was much above normal in twenty-three of the twenty-five cases, ranging from .101 to .300 as compared to a normal of .06 to .08. He also made estimation of the amount of urea in the blood serum and found fourteen of the twenty-five had a urea content of 400 mg. He concludes that these figures apparently settle the question of kidney responsibility.

Relation of High Blood Pressure to the Heart. If the arterial resistance is of a grade that the heart can overcome there will be hypertrophy of the left ventricle. If there is a resistance that cannot be overcome, the left ventricle will not only hypertrophy, but will dilate. In many cases a systolic murmur develops at the apex. If the hypertrophy fails, gallop rhythm and distress supervene. The apex is displaced downward and to the left, the first sound may be duplicated, the aortic second sound is accentuated and ringing.

Sahli gave the name of *high pressure stasis* to certain forms of

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heart failure with high blood pressure and yet with broken compensation. The slowing of the blood flow produces an overcharging of the blood with CO_2 and this produces, in turn, an asphyxia of the centers of the medulla with a consequent vaso-constriction. When a point is reached where the heart empties itself incompletely, but against high pressure, the residual blood leads to cardiac dilatation and venous stasis. This further increases the asphyxia of the medullary centers and so a true vicious circle is set up.

Osler observed that systolic pressure may be high even in a failing heart. In serious degrees of myocardial affection, such as fatty degeneration, it is low. Probably in early stages of failure the heart is stimulated to put forth increased energy at each beat with slight increase of systolic pressure.

Blood pressure examinations in aortic insufficiency show a constantly high pulse pressure which is almost pathognomonic.

Obesity is strikingly common in association with high pressure. Faber showed high pressure in 50 per cent. in a study of 211 cases. Feissinger found that after the age of forty, nearly one-half of obese patients weighing over 100 kilo showed increased pressure, and that, in the absence of kidney disease, a considerable fall in pressure, corresponding with a reduction in the weight, may be secured. T. C. Janeway reported it in 15.7 per cent. of private patients and in 29.3 per cent. of his hospital patients exhibiting hypertension. He calls attention to the point that these patients come from the age period in which obesity is common.

Intracranial Causes. Brain tumors, cerebral hemorrhage, meningitis, increased intracranial tension, cerebral thrombosis, and fracture of the skull, are often characterized by very high pressure readings.

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Systolic blood pressure may rise to 300 or 400 mm., diastolic to 160 or over, pulse rate low, sixty or under. Cushing has shown that when the intracranial tension rises above the blood pressure, anemia of the vasomotor center brings about a tremendous vaso-contraction and action of the augmentor fibres in increasing to strength of the heart beat. The blood pressure rises in successive stages (Tranbe-Hering Waves) until the mean pressure exceeds the intracranial pressure. The rise of blood pressure expresses the need of the brain for blood. To counteract the vasoconstriction with nitrates or other vasodilators, or venesection only increases the task of the heart. A. D. Hirschfelder (Dis. of the Heart and Aorta).

Hypertension in Women. Reisman (Jour. A. M. A., p. 330-V. 73) expressed great surprise at the frequency of high blood pressure in women. He said most of them could be classified into a distinct group having the following general characteristics:

1. Overweight and undersize.
2. Have had many children.
3. No history or symptoms of Syphilis.
4. Over forty-five years of age—majority between fifty and sixty years.
5. All constipated—a great many with intestinal indigestion.
6. They show an amazing tolerance to high blood pressure.
7. Heart usually enlarged, chiefly to the left.
8. Arteries soft, no retinal involment.
9. Kidneys usually competent.

The absence of renal and arterial changes led writers to speak of such hypertension as "essential" which is an adequate way of concealing our ignorance of the real trouble. Similar cases of high blood pressure are frequently found in men, but they are usually less innocent.

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BLOOD PRESSURE

The chief causative factors in this group seem to be:

1. Multiple gestations.

Whether due to the pregnancies themselves or to the worries incident to rearing a large family is a question. Both probably have a part.

2. Worry—this is rarely absent in some form, either household and domestic worries or other trials and tribulations of the soul.

3. Menopause. The high pressure begins to appear at this time in such a large majority of cases that this is an unquestionable etiologic factor. This relationship suggests that this form of high blood pressure is based on some endocrine disturbance, not improbably arising in the ovaries. Nearly 50 per cent. are widows.

The inaugural symptoms complained of are vertigo, tinnitus, dyspnea on exertion, anginoid pains, palpitation, and vasomotor disturbances. Though several of the above symptoms may occur in the same patient the disease is often monosymptomatic in the beginning.

The physical findings are as follows: Patient is usually florid. Obesity is practically constant. The cardiac and aortic dullness are increased, a systolic aortic murmur, extending upward to the clavicle and a ringing second aortic sound are common findings. In the later stages a soft systolic murmur can frequently be heard at the apex. The peripheral arteries are soft in striking contrast to the high blood pressure. An almost constant finding is a slight elevation of temperature, usually 99 to 100 degrees. Anders says the murmur is not due to a stenosis, but to a roughening of the valve segments of the intima of the aorta, that the slight fever is probably due to an associated aortitis and, if we accept Allbutt's view, the aortitis also accounts for the angina pectoris.

The average age is fifty-four years; the youngest, forty-three; oldest, seventy-one.

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BLOOD PRESSURE

The average pressure was 211 mm. systolic, 105 mm. diastolic, Average pulse pressure, 106 mm. Highest pressure was 310 mm. Highest pulse pressure, 150 mm.

One patient had a pressure of 290 mm., had normal urine, normal eye grounds and was well and active. Her only complaint was ringing in the ears.

The above group is not the only kind of hypertension found in women. Chronic nephritis with high blood pressure is rather common. High blood pressure occurring in women under thirty-five is practically always nephritic.

I will only mention high blood pressure in *acromegaly* and *exophthalmic goiter*. There is a closely allied type, the *nongoitrous, thyrotoxic hypertension,* that is of considerable clinical interest. This type also appears chiefly in women, patients near or past the *menopause,* not fat. They complain of palpitation, nervousness, and headache, are emotional and sweat, have tachycardia and tremulous hands. Von Graefe's sign may be present, but no exophthalmos or goiter, no tangible abnormality of the thyroid gland. Systolic pressure from 150 to 210 mm., diastolic 90 to 120 mm.

While there is no proof of a thyroid cause and the patients are usually past the age of ordinary hyperthyroidism the symptoms closely resemble those of thyrotoxicosis. The trouble may be *pluriglandular*. It apparently is not renal or arterial.

Prognosis: The first type is benign. The high pressure is surprisingly well tolerated for years. Death usually occurs from:

1. Angina pectoris, which is more common in women than is ordinarily believed and especially in this type.
2. Apoplexy.
3. Decompensation, late stage from myocardial exhaustion.

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BLOOD PRESSURE

Blood Pressure in Surgery. As a factor in the preliminary examination, for judging the condition of the patient during operation and in following up the post-operative recovery, the blood pressure examination is of great importance. Some of the pathologic conditions which bear directly on the chance of recovery from the operation and the anesthetic are indicated by characteristic readings.

The pressure ratio, a fraction having the pulse pressure as numerator and the diastolic pressure as denominator, may be normal between 40 and 60 per cent. (Example: Systolic 120 mm. Diastolic 80 mm. Pulse pressure 40 mm., pressure ratio 40-80 or 50 per cent. E). If the ratio is either high or low, there is reason to apprehend danger. If the ratio lies between 25 and 75 per cent. the case is probably operable; if outside these limits it is probably inoperable. C. W. Moots (Am. Jour. Obstet.).

In checking up the accuracy of the rule given by Moots in a series of 1000 cases, it was found that in operable cases 3.23 per cent. of the patients died and 96.77 per cent. recovered; in the inoperable cases, 23.07 per cent. of the patients died and 76.93 per cent. recovered.

Routine blood pressure tests in the course of surgical operations are important. (Convenient method for use of anesthetist described). Changes in the pressure will result from excitement, from obstruction to respiration, from overdose of the anesthetic, from changes in position of the patient, from unusual temperature in the operating room and from hemorrhage or operative manipulation.

Hot and cold applications within the abdomen cause a marked fall—usually transient. Especially when there is considerable visceral exposure, pressure rises and falls with the temperature of the operating room.

Anesthetics, when carefully administered, do not usually cause

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a rise in blood pressure. With cyanosis, the systolic pressure is raised. If excitement is present, the systolic and diastolic pressures and the pulse rate are increased. Profound anesthesia is likely to be accompanied by a rapid decline in blood pressure. Spinal anesthesia is followed by a distinct drop in blood pressure which frequently reaches the danger zone; in one instance the systolic fell to 20 mm. after ten minutes.

A falling blood pressure with an increasing pulse rate is the most certain indication of the incidence of surgical shock. **A. H. Miller (Jour. A. M. A.).**

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BLOOD PRESSURE

Blood Pressure and Life Insurance

Medico-actuarial data has enriched the literature of blood pressure. It has shown that a series of individuals between forty and sixty years of age having an average systolic pressure of 170 mm. (palpation) and no other discoverable impairment will suffer a mortality 150 per cent. above the medico-actuarial table. This data reveals that approximately 78 per cent. of the impairments found with or resulting from blood pressure much over 12 mm. above the age-average are cardio-vascular. Of the deaths occurring in rejected risks, with high blood pressure, 78 per cent. are due to cardio-vascular diseases.

By the following table derived from the combined experience of forty-three companies, the mortality is shown to progressively increase with the increase of each 10 mm. of blood pressure:

Mortality Risks Rejected with High Systolic Tension, August 1, 1907, to August 1, 1915. Ages Forty to Sixty, Inclusive.

MM. Hg. Over the Average Pressure for Age.	Per Cent. Mortality. (Normal 100).
10-14 mm.	114.06
15-24 mm.	180.94
25-34 mm.	205.52
35-44 mm.	246.63
45-59 mm.	253.93
60 mm. and over	450.02
Average	240.43

Low Blood Pressure, in subjects otherwise unimpaired, appears to render them better risks than those conforming to the age-average.

Up to the latter part of the year 1911, we required the systolic pressure only at ages forty to sixty (the company does not insure above age sixty). Since then we have required the blood pressure at all ages and regardless of the amount of insurance applied for.

Prior to the year 1907, when we depended upon the digital determination of the arterial tension, only a fraction of 1 per cent. of applicants were refused insurance for this cause alone. At the

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present time, about 6½ per cent. of all cases rejected are found to have a high arterial tension and in considerably more than half of those with a high blood pressure, the examiner discovers no impairment which would account for the high arterial tension. This demonstrates, and the records of the company show, that many applicants who apply for insurance and who suppose they are in perfect health and normal in every respect, have a high blood pressure while presenting no symptoms or pathological changes discoverable by our present methods of diagnosis. While it is true, and our records show, that an apparently healthy person may carry a high blood pressure for a number of years without any discoverable pathological changes to account for this important diagnostic symptom, there can be no question (and this statistics *prove* beyond a doubt) that if the cause of the impairment is not discovered and removed, premature death will result in a very large per cent.

AVERAGE PRESSURES AT VARIOUS AGES.
SYSTOLIC BLOOD PRESSURE BY PALPATORY METHOD.

AGE PERIODS	TOTAL CASES	AVERAGE
15-19	880	120
20-24	3,920	122
25-29	5,892	123
30-34	6,343	124
35-39	7,146	126
40-44	13,849	128
45-49	9,537	130
50-54	5,294	132
55-59	2,379	134
60-64	680	135
65 and over	201	136

Readings by the Auscultatory Method average about 4 mm. higher.

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BLOOD PRESSURE

Summary of the Mortality Experience of the N.W. Mut. Life Ins. Co., with respect to Systolic Blood Pressure.

Period	No. Risks. Acc'ta.	No. Risks. Rei'ta.	Ages. (Inc.)	B.P. Mm. Hg. Range	B.P. Mm. Hg. Av.	Other Impt.	Mortality to Aug 1st 1915. M.A. Table. 100% 200% 300%	%
Aug. 1st 1907 to Aug 1st 1910	2630		40-60	140-149	142	—		98 16
	521		40-60	150-160	152	—		127 00
		302	40-60		170	None.		280 41
		288	40-60		171	One or more.		302 16
Aug. 1st 1907 to Aug 1st 1915		1274	40-60		160	None.		220 11
		956	40-60		165	One or more.		263 76
Nov. 1911 Aug. 1915		495	16-39		150	None.		142 81
Low B.P. 1907-1910 (Inc.)	200		40-60	105 & under		—		47 00
	427		40-60	106-110		—		65 00
Low B.P. Nov. 1911 to Aug. 1915.	433		16-39	100 & under.		—	2 Deaths.	
	60		40-60			—	No Deaths.	

The Conclusions to be Drawn from this Study, Covering a Period of Eight Years, in My Opinion, Are:

I. That a persistently high arterial tension will result in an excessive mortality, and the higher the arterial tension the greater the mortality.

II. That a persistent systolic blood pressure of about 12 mm. above the average for the age would seem to indicate the limit of normal excess variation in man.

III. That an apparently healthy person may have high arterial tension extending over a considerable period of time without a discoverable impairment to account for same.

IV. That of the medical impairments found, together with high arterial tension, both below and above the age of forty, more than 75 per cent. are cardio-vascular.

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BLOOD PRESSURE

V. That while the normal average blood pressure increases with age so far as investigated (i. e., age sixty or sixty-five), materially higher arterial tension is not necessarily to be expected at older ages.

VI. That persons with a systolic blood pressure between 90 and 110 mm. show a more favorable mortality than persons with a pressure 12 mm. above the average pressure for the age.

VII. That in persons whose weight is 20 per cent. or more in excess of the average for height and age, blood pressure averages about 4 mm. higher than those of normal weight.

—J. W. FISHER (Med. Div. N. W. Mut. Life Ins. Co.)

The *Prognosis* in High Blood Pressure has been touched upon at several points in the foregoing discussion, especially in that part dealing with the mortality records of life insurance companies.

Cadbury (Arch. of Int. Med.) reports deaths in hypertension as occurring most frequently between the ages of forty and sixty years, and the underlying condition being either chronic nephritis or chronic disease of the heart, or both. More than half the deaths occurred with symptoms of uremia or apoplexy. Twenty-eight per cent. died with signs of progressive heart failure. The patients in more than half the fatal cases had had a systolic pressure of over 200 mm. and 86 per cent. had had diastolic pressure of over 100 mm.

Topp tabulated findings at the Finsen Institute in 164 cases of permanent blood pressure above 180 mm. between 1913 and 1916. Reports in regard to 154 cases showed that 83.5 per cent. had died in the intervening three years. The surviving 16.5 per cent. had maximal pressures of 180 to 220 mm. and one 250 mm. There were four between forty and forty-nine, nine between fifty and fifty-nine, eight between between sixty and sixty-nine and five between seventy and seventy-nine years of age.

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BLOOD PRESSURE

There were 118 men to 36 women; 15.3 per cent. of the men and 20.5 per cent. of the women were still living.

In over 60 per cent. of the patients sclerosis of the kidneys was evident and 84 per cent. of these died within two years. The survivors were all patients who were able to reduce physical exertion to the minimum.

Treatment.

In the treatment of hypertension, a routine of regulation is imperative, not alone of diet, but of habits of eating, drinking, sleeping, working, playing, and even thinking. As in everything else, no fixed course can be pursued, but each case must be treated with reference to its individual manifestations in the way of causes and of what we might term its complications.

Salt and water restriction will be found of great value in a class of cases characterized by the high plasma chlorids and the damaged renal filter cited by Allen. When renal function tests show nitrogen retention or when protein putrefaction in the colon is evidenced, the protein intake must be cut down or temporarily abolished. Excess of other foods should also be avoided and over-weight should be dietetically combatted. Much food and little exercise is an unfavorable combination.

In cases of long standing cardio-vascular-renal disease that are to all appearances in excellent health, but have a constant high blood pressure and much of the time have albumin or casts in the urine: Most of these cases may be kept very comfortable and the blood pressure kept reasonably low if they will diet carefully and exercise only moderately. Such individuals should eat but little meat of any kind. Coffee, tea, alcohol, rich spiced foods, and tobacco should be excluded. Fruits, cereals, vegetables—especially the green ones—eggs, milk,

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cream, butter, and in most cases a little meat or shell fish once a day should comprise the diet.

Baths play a versatile part in the therapy. The incandescent cabinet is the premier bath measure for relaxation and moderate skin elimination. It is well supplemented by the neutral tub bath at skin temperature for ten to thirty minutes. The latter bath is sedative and diuretic. The wet sheet pack, applied cool, and continued to the point of beginning perspiration gives a similar result. Progressive pressure reduction will be observed under daily treatment of this kind in all but the most obstinate cases. Brine baths, with or without carbonic acid effervescence, are of value in heart conditions not in late decompensation. The abdominal fomentation is strongly indicated in the intestinal toxemic patient and may be aided by colon irrigation. Massage of the chest, back and extremities is beneficial.

Change of scene, rest—partial or complete, and helpful companionship—preferably that of a tactful nurse—are important for the patient in whom fatigue, responsibilities, or grief have had a causative part.

The high frequency current—900 to 1100 ma. over ten to fifteen minutes—induces moderate dilatation of the arteries, and, repeated, daily, counteracts the habit of vascular over-tone. It is credited with enhancement of metabolism and kidney elimination of wastes. Radium emanations have given similar results in the experience of many.

Radium causes stimulation of normal cells as well as correction of perverted cell action by influence on the enzymes. The radio-active waters are given in doses of 25,000 to 100,000 Mache units a day in divided doses after meals and at bed time, while inhalations are given for two hours daily in an emanatorium, which shows 250 Mache units to the liter of air. In selected cases radium salts are given intravenously and repeated in two weeks. D. C. Moriarta (Med. Rec., May).

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BLOOD PRESSURE

Active treatment in hypertension should begin with a thorough cleansing of the gastrointestinal tract by purgation. As a purgative and also to aid in getting rid of the fluids, mercury probably holds first place and may be given once in a fortnight or once in a week. If there is insomnia a dose of chloral may be given as needed but this should not be continued over long periods. If arterio-sclerosis is present sodium iodide in small doses, 3 grains (0.2 gm.) two or three times a day may be serviceable.

Potassium iodide frequently gives favorable results in luetic cases, but in the non-luetic it is of doubtful utility. Nitroglycerin has only a transient effect and the nitrates may be useful in a certain class of cases. One should be inclined to resort to the use of eliminant drugs rather than the use of vaso-dilators for the relief of symptoms associated with hypertension.

After administration of theocin, 4 gr. t. i. d., the urine increased to normal amount and the blood pressure fell to 160.

It has been observed in studying the toxicity of the urine that certain substances can be isolated which have a powerful influence in increasing blood pressure, whereas, on the other hand, substances have been isolated which have a correspondingly depressing action. This somewhat resembles the conditions met with in Grave's disease, in which, as pointed out by Karl von Noorden, two well defined symptom groups are recognized—the vagotonic, which are hypertensive, and the sympatheticotonic, which are hypotensive—both are unquestionably toxic manifestation. Unless these metabolic poisons can be prevented or chemically neutralized the natural recourse must be toward elimination. H. G. Beck (Ther. Gazette).

Treatment High Blood Pressure

W. D. Robinson, Philadelphia, reports his use of pilocarpine in practically all cases of hypertension without marked cardiac hy-

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pertrophy, and with very gratifying results in nearly all instances. The starting dose for adults in fair condition was 1-30 grain in a glassful of water after meals. This occasionally had to be still further reduced and seldom increased, to secure a gradual decrease in blood pressure amounting to about 30 to 40 mm. in four to six weeks. In one case an idiosyncrasy seemed to exist, so that the dose had to be reduced to 1-100 grain, well diluted, after meals. He finds its results better than those of any other treatment, including the high frequency electric treatment.

The writer is far from believing that vascular drugs are of no value in high blood pressure. In cases of the non-albuminuria type with pressure ranging high and the spastic element predominating I have found the use of Sodium Nitrite, administered in moderate doses twice and thrice daily of considerable value in relieving distress. I recommend a combination of Dr. Lauder Brunton—consisting of Sodium Nitrite, Potassium Nitrite and Sodium Bicarbonate. Keep up constant moderate depletion from the bowel. Phlebotomy is not to be forgotten in the hypertensive cases with polycythemia. Renal cases require strict attention to diet and observation by phenol-sulphonephthalein tests. Elliott (Jour. A. M. A.).

Stoll has outlined a short series of "dont's" for patients with hypertensive cardiovascular disease, which are of distinct service in keeping the etiology and prevention of these conditions in mind.

1. Don't tell the patient with moderate hypertension, few symptoms and whose kidneys are functioning well, to stop eating meat or to go on a milk diet.

2. Don't tell him to immediately give up his business; try to readjust his life so that unnecessary cardiovascular strain is reduced to a minimum.

3. Don't tell him his kidneys are "all right," just because his urine exhibits neither albumin nor casts.

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BLOOD PRESSURE

4. Don't miss the significance of nocturnal polyuria and a persistently low gravity.

5. Don't give nitroglycerin tablets to your patient the moment you discover that he has hypertension. Perhaps he requires a high pressure to get the blood through his small inelastic vessels.

6. Don't be satisfied with the systolic pressure—the diastolic is often of more significance.

7. Don't attribute the insomnia, nervousness and headaches in the middle aged women to "the change"—take her blood pressure and examine her eye grounds.

8. Don't make a diagnosis of neurasthenia till after a blood pressure estimation and a Wassermann test. It may save subsequent embarrassment and even be of advantage to the patient.

9. Don't think you are doing your whole duty to your pregnant patient when you have examined her urine. She may have hypertension but no albumin today and eclampsia next week.

10. Don't consider hypertension solely a condition of middle life; it is occasionally present in childhood.

11. Don't forget the old man's enlarged prostate. It may be the cause of the nephritic syndrome.

12. Don't hesitate to give digitalis when symptoms of cardiac failure are evident. It will not raise the blood pressure.

13. Don't wait until the patient is water-logged and the heart dilated before suspecting a failing myocardium.

14. Don't deny your sleepless, gasping patient, whose course is nearly run, the relief that only morphine will give.

15. Don't make a prognosis solely on the blood pressure or the phenolsulphonephthalein test. Each tells but part of the story.

16. Don't overlook the fact that cardiovascular disease is to a certain degree a familiar condition sometimes present in several

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generations; nor neglect to explain the importance of a yearly blood pressure estimation of all members of the family.

17. Don't exclude syphilis, especially a parental infection, as the cause of the hypertension solely because the Wassermann is a negative. Study the family history; examine the brothers and sisters, and your patient's children for signs of hereditary syphilis.

18. Don't fancy that the management of hypertension consists in watching a column of mercury or that success is measured in millimeters.

Moschcowitz (Anin. Jour. Sc., 158-668) observes that there is a type of hypertensive patient whose most conspicuous mental trait is an inability to play. "He is the antithesis of a child in mind and spirit. If the psychic takes a part in the production of high blood pressure it is advisable to advocate a larger element of play. If age is not merely a matter of years, keep alive that spirit of childhood which is not blighted by the premature struggle for existence or the gloom of a depressing environment. Pack play into those lives knowing only adult life, for in a well balanced life the spirit of a child with its humor, imagination, etc., furnishes that which neutralizes the corroding acid of the fret and fever in our lives."

(*Continued in Number Two*)

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Med.

BLOOD RELATIONSHIP

The Influence of Blood Relationship on the Offspring. (De invloed der bloedverwantschap op de nakomelingschap.) Dr. H. Van Waasbergen. Nederlandsch Maandschr. v. verlosk. en vrouwenziekt, Leiden, No. 3, 133-169.

After extensive researches the author comes to the following conclusions:

1. If the related parents are both sound in body and mind the children will show no abnormal condition that could be attributed to the blood relationship of the parents.

2. When the parents are physically or mentally deficient the condition will be more marked in the children.

3. There is a possibility that a disease which is latent in the family, may not show in the parents, but may appear in the offspring. The tendency to inherit defects from both parents is greater in children of blood related parents than in those of parents who are not related.

4. There is no reason to assume that the influence of blood relationship is of advantage to the offspring or that the children will not be unfavorably affected.

Surg.

BLOOD TRANSFUSION

A Simple Method of Blood Transfusion. (Semplice metodo di transfusione sanguigna.) Dr. V. Luccarelli. Morgagni, Milano, No. 9, 277-284.

To obviate the inconveniences of the usual methods of blood transfusion Dr. L. has originated a new one. He uses a large glass syringe enclosed in a casing also of glass. The space between the syringe and the outer casing is filled with warm water to keep the

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BLOOD TRANSFUSION

blood at an even temperature. By a slight circular projection the interior of the syringe is divided into two parts. The anterior and smaller one, with a capacity of 25 c. c., is intended to receive 25 c. c. of a 6 per cent. solution of citrate of sodium. The larger segment represents the amount of 250 c. c. of blood. After taking in 25 c. c. of the citrate solution the point of the syringe is introduced into the vein of the donor and 250 c. c. of blood are slowly aspired. In entering the syringe the blood mixes with the solution of sodium citrate. The point of the syringe is now plunged into the vein of the patient and 250 c. c. of the liquid are slowly injected, 25 c. c. remaining in the syringe. The injected blood has thus been diluted 10 per cent. Advantages: No danger. No anesthetic needed. No pain of donor or patient. Method is more practical than any other.

Med.

BOWELS DURING PUERPERIUM

The Care of the Bowels During the Puerperal Period. Ross McPherson, Amer. Jour. Obst., LXXX, 698.

Routine catharsis during the puerperium has been the rule for years and many of the abnormalities of this period have been assigned to constipation. It was suggested to the author that such routine administration of cathartics was pernicious and that this often caused more trouble than constipation.

Two series of cases were tabulated at the New York Lying-In Hospital. Patients in Ward A received no catharsis and those in Ward B received the usual routine treatment after delivery. A low saline enema was given every three days to patients in the non-catharsis group if the bowels did not move.

In approximately 1000 cases of each group the febrile morbidity in the catharsis cases was about double that in the non-catharsis cases.

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BOWELS DURING PUERPERIUM

The writer states that he does not wish to infer that the necessity never arises for a cathartic during the puerperium, but he does wish to emphasize the danger and uselessness of routine drugging. He also speaks of the greater comfort of the patient and the saving of time and work for the nurses when cathartics were not used.

Surg.

BRAIN RADIOGRAPHY

Roentgenography of the Brain after the Injection of Air into the Spinal Canal. Dr. W. E. Dandy. Ann. Surgery, Phila., No. 4, 397-408.

By substituting air for cerebrospinal fluid through a lumbar puncture all parts of the subarachnoid space can be clearly seen in a roentgenogram. A small quantity of spinal fluid is withdrawn and an equal amount of air injected into the spinal canal. This process is repeated until the fluid ceases to appear on aspiration. During the operation the position of the body is all-important. The air rises as the fluid gravitates, therefore the head must be at least twenty degrees higher than the needle. The amount of air injected varies from 20 to 120 c. c. What becomes of the air? It disappears from the subarachnoid space quite rapidly. It is absorbed as from other tissue spaces and undoubtedly passes directly into the blood.

After an injection of air the X-ray will show the spinal cord surrounded by a column of air. The cisternae appear as large collections of air at the base of the brain, the cerebral sulci as a network of tortuous filaments of air. The air will fill the cerebral sulci. But if the cisternae are blocked at any point by a tumor or adhesion, the air will not reach the cerebral sulci. The exact position of the obstruction can often be seen in the radiogram.

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Surg.

BRONCHIECTASIS

Treatment of Bronchiectasis by Artificial Pneumothorax. (Ueber Behandlung von Bronchiectasien mit künstlichem Pneumothorax.) Dr. W. Unverricht. Berlin klin. Wochenschr., No. 22, 516.

The internal treatment of bronchial dilation is generally of little value. More promising is a surgical operation. Three surgical procedures are in use: an artificial pneumothorax, a bronchial fistula, or an extensive resection of lung tissue. There is always a certain danger connected with these operations. The artificial pneumothorax promises the most favorable results. Only the internal practitioner can determine the indications for this operation in each case and the duration of the pneumothorax.

The therapeutic effect of this operation is due to the collapse and complete rest of the lung. The cavities are gradually reduced in size and the expectoration decreases. The author gives the details of five cases treated with artificial pneumothorax. He considers all these cases as permanently cured. The treatment lasted from four to five months.

Med.

BUBOES

Treatment of Chancroid Buboes by Injection of Iodoform Combined With a Fatty Body. (Traitement du bubon du chancre mou par l'injection d'un corps gras iodoformé.) Dr. P. Jeanselme. Rev. gén. de clin. et de thérap., Paris, No. 40, 631.

Iodoform is the best means of a rapid cure of buboes. It does not act like a caustic, but it must be kept in contact with the tissues for some time. For the injection iodoform in vaseline (10-15 per cent.) is used. It is warmed in a warm water-bath to render the mixture liquid. Dr. Dinet recommends the following excellent formula:

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BUBOES

Iodoform, 1 gramme; camphor, 3 grammes; olive oil, 100 grammes.

The bubo must show complete fluctuation before this treatment is applied. A puncture as small as possible is made with the bistoury to evacuate the pus. With a glass syringe the vaseline with the iodoform is then injected (usually 4 to 5 c.c.). The point of the syringe is left in place for a few minutes to permit the vaseline to solidify. It is advisable to close the opening with collodium cotton. Pain will soon cease and the patient is usually cured within a week.

Med.

BURNS, Paraffin Application in

William Senger, of the medical staff of the great Colorado Coal and Iron Company, at Pueblo, Colo., refers to the value of paraffin wax in burns. At the Minnequa Hospital the medical staff cares for approximately 13,000. Senger states that the paraffin treatment of burns has the following advantages: (1) Immobiles the wound; (2) protects granulations; (3) stimulates epithelial growth; (4) greatly minimizes pain; (5) renders subsequent dressings easy and much more rapid; (6) prevents excessive scar formation. Burns treated thus certainly heal with extraordinary rapidity. It is not known why this treatment, seemingly so contrary to modern surgical principles, produces such results. Foul secretions containing various bacteria are sealed up, and yet the patient recovers in half the usual time.

Med.

CANCER

A New Cancer Remedy (Ein neues Krebsmittel). Dr. C. D. Isenburg. Aerztl. Rundschau, München, No. 14, 105-108.

The new cancer remedy described in this article, unlike its many predecessors, seems to have real practical value. Its originator is a

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CANCER

chemist, Dr. Steding, who experimented for many years until he arrived at the present composition of the remedy. It is prepared from three fungi (Merulius lacrymans, Agaricus lactaricus rufus and Phallus impudiens). The preparation consists in a peculiar fermentation of these fungi. The remedy is injected in solution under the skin and causes no pain or any untoward symptoms. The solution is easily and rapidly absorbed. Small tumors quickly disappear, large ones are thrown off or are absorbed. In some cases calcification takes place. Seventeen years ago Dr. Steding had a cancer on the thigh of the size of a goose egg. He cured himself with his remedy, producing calcification of the tumor.

An operation may completely remove a cancer but it will not remove the disposition to cancer. Steding's remedy seems to cure this inherent disposition. Dr. Isenburg, the author of this article, has successfully applied the new remedy in many cases. He mentions cases that have remained cured as long as five years. Relapses may occur but if the remedy is again applied the recurrent growth readily disappears. In cases where the new growth has already caused extensive destruction of tissues the remedy is of no value.

Med.

CANCER

Radiotherapy and the Problem of Cancer Treatment. (Strahlentherapie und Krebsheilungsprobleme.) Dr. O. Strauss. Fortschritte a. d. Geb. d. Roentgenstrahlen, Hamburg, No. 8, 232-244.

Early X-ray treatment of cancer is of great value, but there is no means of establishing an early diagnosis. Even a fully developed cancer is frequently difficult to diagnose. Two effects of cancer are harmful: the atypical katabolism of the albuminoids and the diminu-

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CANCER

tion of the oxidative processes in the body. Cancer does not only consume its own albumin but also that of the organs. The heterolytic ferment gets at a later stage into the circulation and we have the clinical picture of cachexia. The cachectic organism is much less sensitive to the X-ray than the non-cachectic.

Carcinoma of the cervix uteri is diagnosed much earlier than any other form of cancer and this explains the favorable results of X-rays in cervical carcinoma. Except in cervical cancer X-ray treatment of cancer is not superior to surgical treatment. The best results are obtained by a combination of both methods. Statistics show that the application of X-rays in operable cancer cases has increased the cures by 30 per cent. The X-ray plays also an important role in inoperable cancer.

Med.

CANCER

How Shall We Best Treat Skin Cancer About the Eye? Dr. W. Neill. Therap. Gazette, Detroit, No. 11, 770-774.

Epitheliomata on the eyelids or on or near the canthi have always been difficult to treat. Surgical interference causes generally a disfigurement and the risk of recurrence is always great. The X-ray treatment has generally given poor results. From an extensive experience in such cases Dr. Neill comes to the conclusion that radium is the most efficient treatment in basal-celled epitheliomata around the eyelids. The technique is simple, causes no pain and leaves no scar. Recurrence is rare. Radium will cure 90 per cent. of basal-celled epitheliomata about the eye if the treatment is applied at an early stage. One hundred to five hundred milligrammes of radium emanation is used for a period of from ten to thirty minutes, depending on each case. Radium can safely be considered the best method of treatment in all such cases.

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Surg.

CANCER OF THE UTERUS

Fibroids of the Uterus (Myomata and Malignancy).

Newton Evans, Rochester, Minn., in *Surgery, Gynecology and Obstetrics* discusses "Malignant Myomata and Related Tumors of the Uterus," and reports seventy-two cases in a series of 4,000 operations for myomata.

He points out that malignant tumors of the uterus comprise a numerically important portion of malignant tumors in women. These are mostly epithelial tumors in the proportion of about 40 to 1. It is the non-epithelial malignant tumors or sarcomata that he considers.

The tumors frequently originate within the structure of fibroids or may occur as tumors which, clinically or even at operation, may not be distinguishable from ordinary fibroids. Extensive local infiltration and fixation of the tumor render it of suspicious character.

There is a lack of understanding and agreement as to histologic criteria which denote malignancy. Kelly and Cullen stress inequality in size and increase in size of the tumor cells and do not consider mitotic figures as essential to the diagnosis of malignancy. Proper and Simpson state that in doubtful cases the absence of mitotic figures indicates a benign tumor. Lockyer, in a recently published book on fibroids, emphasizes the tendency to infiltrate and the presence of mitotic figures as the distinguishing characteristic of malignancy, but says that malignant myomata are often difficult to distinguish. Many tumors which show "sarcomatous tendencies" and which are classified as malignant or doubtful by the pathologist are really benign and not true sarcomata or cancers.

In the seventy-two cases reported by Evans from 4,000 operations for myomata at the Mayo Clinic, they were able, by microscopic examination, to classify the tumors according to relative

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malignancy by the number of mitotic figures found and this grouping of the tumors was closely borne out by the after course of the cases. The more mitotic figures found the more frequently will recurrence take place.

He concludes that as these tumors are difficult to distinguish in the early stages from ordinary fibromyomata and as they are not cured by X-ray or radium, the surgical removal of all fibroids of any appreciable size seems to be the rational procedure.

Surg.

CANCER OF THE UTERUS

The Precancerous Uterus: F. J. McCann, Proc. Royal Soc. Med., London.

The writer believes that the time to attack cancer is before cancer develops, that is, in the precancerous stage. If we wait until frank cancer has appeared, it is usually too late. Precancerous conditions must be recognized and its development anticipated.

He divides precancerous conditions of the cervix into four groups:

1. Erosions, which are, in reality, an overgrowth of the glandular tubules and interglandular tissue and not true ulcerations. Where actual ulceration is present, not due to trauma, the condition is tuberculous, syphilitic or malignant and should be regarded as malignant until proved otherwise, for tuberculosis and syphilis of the cervix are rare. He disapproves of the use of irritants or caustics in the treatment of erosions, and advises complete excision.

2. Fissures or lacerations: A laceration of the cervix is always a possible starting point for cancer. It is not alone the deep lacerations, but also the smaller ones which, by causing epithelial cell dislocations and inclusions, may predispose to cancer. This is especially

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true when lacerations are associated with inflammatory changes and such changes are very prone to occur in cervices that have been lacerated. Immediate repair of lacerations of the cervix is the proper prophylactic measure, for statistics seem to show that cancer is less frequent in cervices that have been stitched.

3. Chronic Endocervicitis: A chronic discharge from the endocervix in a woman who is approaching middle life or the cancer age is a danger signal. The deeper glandular structures are involved, as a rule, in the endocervicitis and local applications and curetting fail to reach all the diseased parts. Complete removal of all the endocervix by high amputation is the proper procedure. Or, if there is any suggestion of an associated metropathic condition, a pan-hysterectomy should be done. Conservation of normal ovaries is urged.

4. Chronic Hypertrophy: This is due to inflammatory infiltration and thickening and is usually associated with lacerations. Where chronic hypertrophy is marked in the absence of tears he advocates high amputation.

Precancerous conditions of the uterine body are likewise grouped.

1. Fungous Endometritis: This he describes as an actual overgrowth or adenomatous change in the endometrium which may later take on malignant character. In all such cases the uterus should be removed if the woman is nearing the menopause.

2. Chronic Metritis: Under this head are included all those uteri which are enlarged and tender or painful and especially where free bleeding occurs at the menses with an interval discharge. Palliative treatments are usually useless and hysterectomy is the safest procedure.

3. Intra-uterine polypi: Removal of the uterus should be done if adenomatous polypi are found and if "fibroid polypi" are found they should be examined for sarcomatous evidences.

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CANCER OF THE UTERUS

4. This group embraces metropathic conditions developing after the menopause, aside from prolapsus and acute infections. Increase in size of the uterus or the appearance of a discharge or bleeding call for prompt removal. So called "senile endometritis" is to be regarded as a precancerous condition.

[EDITORIAL COMMENT: These measures advocated by McCann would seem to be rather radical, but, in view of the steady increase in cancer some such measures must be adopted to check this disease. Cancer never begins as a cancer but is a secondary development from a pre-existing lesion. All the conditions that he enumerates are potentially cancer, but are in the curable stage. If we pursue a "hands off" policy until cancer develops we may save many of these women with precancerous conditions from an operation, but those who develop cancer will stand small chance of cure.]

Med.

CATARACT

Medical Treatment of Cataract. (Le traitement médical de la cataracte.) Dr. L. Dorr. Clinique ophtalmol., Paris, No. 6, 319-321.

Dr. Dorr bathes successfully both eyes for twenty minutes in the following solution warmed in a water bath:

Crystallized calcium chloride	4 g.
Desiccated sodium iodide	4 g.
Distilled water	500 g.

By this method of treatment the author prevents the development of cataract for a very long time. He mentions a case where the patient showed signs of cataract in 1902. The treatment mentioned above was followed and the patient has still fairly good vision in both eyes.

In an earlier article Dr. Dorr has demonstrated that cataract is due to a hydration of the lens and not, as it was formerly believed,

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CATARACT

to a dehydration or sclerosis. This hydration is caused by hydrating ferments in the blood. The serum of certain diabetics contains such hydrating ferments and this fact explains the frequency of cataract in diabetics. The dehydrating properties of calcium are well known and Dr. D. makes use of these properties in his treatment. He concludes his article with the remark that if we could introduce into the blood a dehydrating ferment which would annihilate the action of the hydrating ferments that produce cataract the problem would be solved.

Med.

CATARRH (Nasal)

Observations on the Bacteriology of Chronic Nasal Catarrh and Its Treatment by Autogenous Vaccines. Dr. L. Mackey. Brit. Med. Journ., London, 159-160.

In 558 cases of nasal catarrh Dr. Mackey found the following organisms: Pneumococcus in 191 cases, Bac. influenzae in 142 cases, Micrococcus catarrhalis in 119 cases, Staphylococcus aureus in 104 cases, Streptococcus in ninety-three cases, the Friedlander bacillus in forty-one cases, Staphylococcus albus in forty-six cases, Tetragenes five times, Proteus four times. Three hundred and fifty-one cases showed a pure culture, 207 cases were mixed infections. During the last seven years Mackey has treated more than 500 cases of chronic nasal catarrh with autogenous vaccines. The vaccines were prepared from the germ or germs which he considered responsible for the pathological process. He used mixed vaccines when the cultures revealed two or more germs. The most frequent vaccine used was that of the pneumococcus either alone or associated with some other germ. The results were good. Half of the patients were entirely cured; all other cases were improved by the treatment.

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Med.

CEREBROSPINAL MENINGITIS

Observations on Acute Epidemic Cerebrospinal Meningitis and Bacillus Carriers. (Iets over meningitis cerebrospinalis acuta epidemica en de bacillendragers.) Dr. C. Orbaan. Nederlandsch Tijdschr. v. Geneeskunde, Amsterdam, No. 2, 101-105.

The author treated eighteen cases of cerebrospinal meningitis of which five died and thirteen were cured. In all cases the treatment consisted in intraspinal injections of antimeningococcus serum. But the interesting fact is that in two cases he found the meningococcus in the cerebrospinal fluid after the patients were completely cured.

In one case the patient was suddenly seized with severe headache and an hour after was brought unconscious to the hospital. Kernig's sign, the irregular pulse, the stiff neck, and all symptoms pointed to cerebrospinal meningitis. Lumbar puncture was at once performed, about 45 c. c. of fluid withdrawn and 20 c. c. of antimeningococcus serum injected. Half an hour later the patient recovered consciousness and was free from headache. On the following day the patient was perfectly well. But when the laboratory report on the bacteriological examination was turned in it did not mention any meningococci. Dr. A. now doubted his diagnosis. He performed another lumbar puncture and withdrew 20 c. c. of fluid. The bacteriologist now found meningococci in the fluid though the patient was perfectly cured. The same condition was found in another patient who proved to be a meningococcus carrier after a complete cure.

Med.

CEREBROSPINAL MENINGITIS,

A SYSTEMIC DISEASE, RATIONAL TREATMENT

Epidemic. In a series of twenty-five consecutive cases of cerebrospinal meningitis in the Base Hospital, Camp Jackson, Columbia, S. C., Baeslack, Bunce, et al. (Journal A. M. A., Vol. 70, pp. 684-686) found 36.2 per cent. positive blood cultures. When it is considered

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CEREBROSPINAL MENINGITIS

that the meningococcus, under the most favorable circumstances, is hard to grow artificially, and that a blood organism is highly parasitic, it is believed that the incidence is much higher than the percentage found would indicate. Their conclusions were as follows:

"1. Systemic infection by the meningococcus is more frequent than previously suspected.

"2. This systemic infection may occur without appreciable or with no meningeal localization.

"3. Systemic infection may be previous to, or coexistent with, meningeal involvement.

"4. Consequently the intravenous administration of antimeningococcic serum is rational, and is indicated in conjunction with intraspinal treatment."

Surg.

CESAREAN SECTION

Extraperitoneal Cesarean Section and My Transperitoneal Method Isolating all Tissues Susceptible of Being Infected. (La operacion cesárea extraperitoneal y mi método transperitoneal con aislamiento de todo tejido susceptible de ser infectado.) Dr. Ruiz Contreras. Rev. española de med. y cir., Barcelona, 305-308.

The extraperitoneal operation exposes the patient to the danger of pelvicellulitis. The dangers of the transperitoneal method are infection and peritonitis. To obviate these dangers the author proceeds in the following manner: Large incision of abdominal wall. Placing two pincettes at the ends of the intended uterine incision. Isolation of the field of operation with towels. Buttonhole incision of the uterine wall, but only through a part of its thickness. Dissection of the remainder of tissues with the finger and the handle of the

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CESAREAN SECTION

bistoury until the finger penetrates between the uterine wall and the fetus. This opening is widened by scissors. The margins of the uterine incision are protected by a square piece of impervious cloth divided in the center so that the protecting cloth can be tucked under the wound margins. The membranes are incised and the fetus removed. The appendages are removed (with aseptic gloved hand). The impervious piece of cloth is taken off and the uterus sutured in two layers. The wound margins of the parietal peritoneum are sutured to their respective sides of the uterine suture, so that the peritoneal cavity is closed off.

Med.

CHOREA

Treatment of Chorea by Subcutaneous Injections of Sulphate of Magnesia. (Sulla cura della corea grave con iniezioni sottocutanee di solfato di magnesia.) Dr. R. Cavalieri, Policlinico, Roma, No. 14, 421-423.

Dr. Marinesco of Rome treated four cases of severe chorea by intraspinal injections of sulphate of magnesia with excellent results. But Dr. Cavalieri objects to this method of treatment because it exposes the patient to grave dangers, especially to paralysis of the respiratory center. Cavalieri has obtained excellent results in a grave case of chorea by subcutaneous and intra-muscular injections of small doses of sulphate of magnesia. He used a 25 per cent. solution (4 c. c. of purest sulphate of magnesia to 16 c. c. of dist. water), and injected 2 c. c. of the solution 2 or 3 times in twenty-four hours. In grave cases of chorea in which the extreme motor excitement keeps the patient from sleep this treatment is of great value.

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CHOREA

Comte—Fribourg—Revue Medicale de la Suisse Romande. Geneva.

Considerations générales sur sa pathogénie et contribution a son traitement.

Chorea minor, Chorea of Sydenham or chorea of childhood, St. Vitus dance, Dance of St. John or St. Guy.

Many theories have been advanced in the past ten years in regard to the pathogenesis of this malady.

Rheumatic Theory—The frequent association of rheumatism with choreic cases has been well substantiated.

Roger, See and Simon have noted rheumatic manifestations in the cerebro spinal nervous system or its coverings in numerous cases of chorea.

That theory explains the cases complicated by rheumatism but not those in which there are no evidences of rheumatism, which constitutes about seventy per cent. of all cases. Charcot is strongly opposed to this hypothesis.

The relations between chorea and the infectious diseases are numerous.

The specific infectious agent has not yet been demonstrated with certainty.

Triboulet maintains that the cause is a non-specific infection. Chorea is, according to him, almost always preceded and accompanied by a cyclic febrile affection, grippe, an eruptive disease, or some other malady.

The chorea is the result of the affection, but predisposition of a nervous nature must be present in the case to permit of its development. The action on the nervous system is due to microbic influences —germs or their toxins.

That theory explains only certain severe cases, but not the apy-

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retic, non-complicated cases—those following a violent moral shock, or the purely neurotic affection.

To explain these latter cases it becomes necessary to add to the infectious or microbic hypothesis the role played on the nervous system by the auto-intoxications—a role identical with that exercised by the microbic toxins. (Crespin, de Tessier and Moussous.) This condition furnishes the necessary predisposing nervous condition and accounts for the cases developed as a result of nervous shock.

Neurotic Theory. This theory is supported by the older authors—Charcot, Joffroy, Comby, Leroux and Blocq. Its advocates assert that chorea is caused by a neurosis manifesting itself by motor disturbances of a psychic, or even sensitive character. It is of variable intensity and curable without sequential complications.

In the opinion of Joffroy it is an evolutionary neurosis because it develops during the period of disturbances due to growth. He notes the manifestation of nervous degeneration, motor and psychic. Comby designates it a neurosis of growth. The nervous theory explains the simple, apyretic, uncomplicated cases. However, that theory is contradicted by certain facts. A nervous affection implies extreme irregularity in the progress of the functional trouble, as in hysteria, for example. Chorea, on the other hand, does not pursue an irregular course. It is sometimes cyclic and may develop cardiac complications, and in many instances fever. The theory of a pure neurosis is then insufficient. Kraft Ebing asserts that there are two forms of minor chorea, infectious and neurotic. He states that in 31.9 per cent. of his cases there had been an attack of acute rheumatism, in 8.5 per cent. there had been another form of infection (nature not stated), in 34 per cent. infection of unknown nature and in 25.5 per cent. no infection was found.

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CHOREA

Organic Theory. A more recent theory is that chorea is an organic disease. Under the designation neurotic is understood an affection characterized by functional disturbances of the nervous system without appreciable organic lesion. That idea, however, did not satisfy the scientific mind, and long ago the savants were searching for an anatomic basis. The advocates of the organic theory admit that chorea is the result of an infection which has, in turn, produced an organic lesion or lesions which caused the syndrome known as Sydenham's chorea. That is the theory advanced in 1909 by Thomas and later endorsed by Tinel, Babinski, Hutinel, Delearte, Strümpell, etc. Details of the subject may be found in a publication by Delearte and Valette which appeared in No. 7, Vol. XVI, Archives de medicine de enfants, also in a Thesis by Dr. Loubet which appeared in 1912 at Toulouse entitled "Considerations pathogeniques et critiques sur la choree de Sydenham," and in which Loubet affirms that chorea seems to be caused by a light and transitory encephalitis, usually cured without leaving traces.

The signs that chorea is of organic origin are of two kinds: The signs of pyramidal irritation described by Babinski, and those of cerebral lesions by Thomas. These signs are of unequal value, because of their variability and the difficulty of determining them on account of the choreic instability. Moreover the signs disappear rapidly. Numerous autopsies have established the reality of the organic lesions—meningoencephalic hyperemia, embolism, hyperplasia, and cerebral sclerosis. All regions of the brain have been involved, especially about the fissure of Rolando.

The lesions verified are acute encephalitis, small hemorrhagic points, perivascular edema, leukocyte infiltration associated with fine cellular lesions.

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CHOREA

A final argument in favor of the organic nature of chorea is the frequent presence of mental troubles (modifications of character, irritability and failure of memory and intelligence). Loubet says the cellular lesions are slight and permit of complete restoration to health.

These are the principal theories as to the causation of chorea. We cannot without more exhaustive study and pathological verification accept any of them as explaining all the cases. Among predisposing causes alcoholism and neurotic states of the parents may be considered as having a bearing. In the cases due to auto-intoxication there is almost always gastro-intestinal trouble due, usually, to dietetic errors.

Treatment: The question of diet should receive careful attention in all cases, but especially in those caused by auto-intoxication. Both the latter class and those associated with rheumatism should be restricted to a vegetarian diet with milk and light soups. The question of treatment of choreic cases is not yet settled. There is no form of treatment that is specific. A great many medicines have been recommended, tried and laid aside; to enumerate those would be superfluous. A few of the most important will be reviewed, especially those of later years, and the most rational and successful plan of treatment will be given in detail.

The advocates of the rheumatic theory advocate the use of sodium salicylate, 0.5-1.0 (7½-15 gr.) several times daily. This treatment gives amelioration of the rheumatic symptoms but does not appear to shorten the duration of the chorea appreciably.

It will suffice to name a few of the remedies that have been recommended in the treatment of chorea, mostly with indifferent success; among the most prominent are belladonna, ergot, strychnia, sulfonal, chloral, hedonal, scopolamine, etc. Antispasmodics, such as valerian, oxide of zinc and potassium bromides are of little use.

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CHOREA

Injection of a solution of magnesia sulphate into the subarachnoid space has been employed by some physicians. One of the first reports of that method was in the Gazette hebdomadaire des sciences medicales de Bordeaux, Nos. 35 and 36, 1911. The method introduced by Marenesco is as follows: After withdrawal of 10 c. c. of the spinal fluid an equal quantity of a twenty-five per cent. solution of magnesia in distilled water is injected into the cavity. He used this treatment in five cases, in four of which cure resulted in a few days from one or two injections. In the fifth case there was marked improvement from one injection, the patient left the hospital before a second was given and the case was lost sight of. Other writers also have reported cures from this treatment. It is not regarded favorably by the majority of authors, because of difficulty of administration and danger, serious accidents and even fatal results having occurred from its use. Moreover as the tendency of the disease is toward cure and as it is rarely fatal, the intra-rachidean injection would not seem to be warranted unless in a very grave case which had resisted other forms of treatment.

Arsenic stands at the head of all forms of treatment thus far presented. It may be employed in the form of pills (arsenite of soda) for the larger children, or Fowler's solution may be given in progressive doses, 2 to 10 drops per day, over a period of some weeks. By this treatment a cure is usually obtained in four to six weeks. Occasionally a case is encountered which does not yield to this treatment, and others after several weeks show symptoms of chronic poisoning even resulting sometimes in paralysis of the lower extremities. The newer preparations of arsenic, Salvarsan, Neosalvarsan, etc., have been used in a few cases. Salinger (Munisch med. Woch. No. 25, 1912), reported a case in a girl of ten years with syphilitic ulcers and a severe case of chorea in which he injected intravenously, 0.10 sal-

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varsan. She showed an amelioration of the choreic symptoms the same evening and in fifteen days the case was cured. Only one injection was given and was the only treatment employed.

Lurieux (La Pathologie infantile) reports the case of a girl eleven years of age who was cured in eighteen days of a severe form of chorea by three rectal injections of salvarsan, 0.20 in 150 gm. distilled water. This simple and harmless form of treatment appears worthy of thorough investigation. Comby employs the liquor of Boudin (1 per cent. aqueous solution of arsenious acid); when this is administered very much diluted and on a full stomach tolerance is greatly increased and irritation of the digestive tube very much lessened. By diluting liquor of Boudin in a julep gommeux 120.0 a solution of 1-10000 is obtained. A soup spoon of this immediately followed by a glass of milk or barley water will give no offense to the digestive organs. With these precautions the child may be given increasing doses from 5 up to 25 mm. of arsenious acid, daily.

This treatment will cause the choreic symptoms to disappear in a few days. Marked amelioration will be observed in three or four days and a cure in from seven to fifteen days. Comby treated twenty-three cases by this method and cure resulted in every case; the average time required in this series of cases to produce a cure was nine days.

In addition to the medical treatment attention should be given to the diet, which should be limited to milk and soups. The patient must be kept in bed for ten days and should be disturbed as little as possible. The bowels should be kept open; if constipated, castor oil should be given.

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Med.

COLON HYGIENE

J. H. KELLOGG

Dr. J. H. Kellogg of Battle Creek, Michigan, in his widely circulated book on "Colon Hygiene," mentions in the chapter devoted to influences which excite movements of the colon that "bulk" food should enter into the diet of patients suffering with constipation.

Fruits and fresh uncooked vegetables are used far less than they should be by the majority of people, especially by the poor. The Russian peasant keeps his bowels regular by the use of sauerkraut, which serves him the same purpose as the products of the silo do the farmer's cattle.

Vegetables, especially such vegetables as carrots, turnips, beets, parsnips, lettuce, cabbage, and spinach, contain a large amount of cellulose, which is not readily digestible by the human digestive organs. This cellulose is highly important to make the nutritive elements of the food less concentrated and to furnish to the intestines the necessary stimulus to cause them to move the food and food residues along at a proper rate.

Dr. Kellogg's observations of patients suffering with constipation, covering a period of forty years as superintendent of Battle Creek Sanitarium, show that in operations upon the stomach and intestines the influence of mechanical stimulation is often seen. Slight pressure upon the wall of the stomach or of the intestine is sufficient to set up a contraction which follows in a few seconds. Contraction of the intestine, as shown by Bayliss and Starling, is accompanied by dilatation of the intestine lower down, so that room may be made for the material that is being pushed along. Contact of the food with the interior of the intestine produces like effects. The greater the bulk of food, the greater the effect. As shown by Cannon, segmentation, a most effective means of food propulsion, becomes really active only when the bowel is distended.

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COLON HYGIENE

All foods which are completely digested and absorbed by the intestine, leaving little or no residue, discourage peristalsis. This is the reason why rice, boiled milk, and fine flour bread have become generally known as constipating foods. These foods are not actively constipating; they simply do not leave sufficient indigestible residue to afford the necessary mechanical stimulation of the intestine.

In general, continues Kellogg, all animal foods encourage constipation, for the reason that they are completely soluble in the digestive fluids. Hair, feathers, and bones are almost the only animal tissues not capable of complete solution in the digestive juices. It is in part for this reason that carnivorous animals always eat bones with the flesh on which they feed; the bones are, of course, necessary also for the lime which they contain, and is almost wholly lacking in the soft tissues of animals. Most carnivorous animals also eat more or less vegetable food. Cats and dogs often nibble grass, and special weeds, of which they appear to be extremely fond. Fowls eat feathers and sand. Horses become sick when fed on corn alone. They must have a liberal supply of coarser material. A Maine ship captain saved a cargo of mules, when the supply of hay was swept overboard, by feeding them shavings made by the ship carpenters. A number of horses in the cargo refused to eat the shavings and died. In England, when the price of grain is high, the farmers feed their stock on treacle, which is exceedingly cheap, combined with wood sawdust, and with good results. The animals readily fatten on this diet, and remain in good health.

Most primitive people recognize the need of bulk to maintain healthy action of the alimentary canal. The Japanese and Chinese make large use of various seaweeds. One of these under the name of agar-agar has come to be well known in this country.

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COLON HYGIENE

Agar-agar is prepared from a seaweed that grows on the coasts of Japan and Ceylon. It is sometimes known in commerce as Ceylon moss. It is also known as Japanese isinglass or vegetable gelatin. It does not, however, have the composition of gelatin. Its composition is practically identical with cellulose. It is almost wholly indigestible in the human alimentary canal. The commercial product is prepared from a seaweed, by cooking the seaweed in large kettles, then cooling the concoction, and passing it through colanders, by which it is formed into long strings. These are dried in the sun, and then bleached in the sun and dew for several weeks. This material is brought to the United States in large bales. In its commercial form, as it is obtainable at many drug stores, agar-agar is hardly fit to be placed in the stomach. It needs to be thoroughly washed and disinfected by peroxide of hydrogen or some other efficient means. It is also very tough and inedible.

Mr. George Kennen, the celebrated Siberian traveler, stated to the writer that the Eskimos eat half digested reindeer moss as a remedy for and preventive of constipation. The predigested moss is obtained by killing the reindeer at a certain time after feeding, removing the moss from the stomach, and submitting it to a very slight preparation.

The natives of Japan and China eat quantities of dried raw turnip or similar vegetables with rice, which forms the staple food of these people.

The Alaska Indians gather and dry a seaweed, which they eat at all seasons as a laxative.

A missionary nurse working among the Alaska Indians sent us a few years ago a sample of the seaweed which is used in its native state by these people to prevent the constipation which would naturally result from the nearly exclusive fish diet on which these

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Indians are compelled to subsist at certain seasons of the year. The seaweed is simply gathered and dried in the sun and pressed into large flat cakes between stones. The material thus prepared is very black in color, but is crisp and not unpleasant in flavor.

The Hopi Indian makes a good laxative food by grinding up in a stone mortar the whole nut of the pinon, including the shell.

The Highland Scotchman escapes the constipation which would otherwise result from his diet of buttermilk, oatmeal, and potatoes, by eating his brose (oatmeal) in a half raw state.

The wild Arab supplements his diet of camel's milk and dates with wheat ground in a stone mill, which supplies all the cellulose of the bran, with the addition of a certain amount of pulverized stone.

The Orinoco Indians and the poor whites of the Tennessee Mountains combat constipation by eating considerable quantities of clay, as do horses and other animals when fed on a too concentrated diet.

The desire for bulky green things, which afford much bulk with little nourishment, that almost every one experiences in the early springtime, when the oncoming heat reduces the bulk of the food by lessening the appetite, is an instinctive prompting which cannot be disregarded without injury.

A western pioneer, who was shut up in the mountains of the Coast Range by an early fall of snow, and confined for three months with several companions and a number of mules with no food but corn meal, escaped without injury, although his associates all suffered extremely from scurvy, by following the example of the mules, who dug tunnels in the fifteen-foot snow drifts and ate the grass hidden underneath.

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A diet consisting largely of meat, eggs, milk, cane sugar and fine flour bread leaves little or no residue to act as a stimulus to the intestinal muscles. The free use of greens and salads of lettuce, cabbage and other uncooked foods fresh from the garden is essential to healthy intestinal activity.

The Sugars

Other elements of the food besides bulk, exert marked influence upon the activity of the digestive organs. All the sugars stimulate intestinal activity. Roger thinks this action is confined to the small intestine, but in this he is in error, for every abdominal surgeon knows the remarkable laxative effects of an enema consisting of a half pint of molasses with an equal amount of hot water.

Cane sugar is undesirable, however, because of its irritating effects. The sugars of fruits—levulose and dextrose—are wholesome and efficient. The malt sugar produced by the action of the saliva upon starch is of great service as a stimulant of gastric and intestinal activity. Many mothers know of the laxative effect of milk sugar added to the infant's food. Malt sugar is better, because free from germs, and more native to the body than the sugar of cow's milk.

Malt sugar, as shown by recent experiments, is absorbed in one-fourth the time required for milk sugar.

Fruit and Vegetable Acids

The acids of fruits and vegetables—citric, malic, and tartaric—are excellent laxatives. This is, in part at least, the explanation of the good effects of an orange taken at night or before breakfast. All acid fruits are laxative. The tomato, a vegetable fruit, is a most excellent stimulant of intestinal action, chiefly through its citric

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acid. When possible, the tomato as well as other acid fruits should be eaten raw, to obtain the best effects.

Lactic and acetic acids developed in the intestines by the growth of harmless acid-forming bacteria are a powerful stimulant of intestinal action. A. Schmidt of Halle, Germany, has demonstrated that these acids are the normal stimulants of the colon. When they are present in sufficient amount, bowel activity is normal. Putrefaction produces an alkaline condition in the colon which has a paralyzing effect upon the intestinal movements. Sour milk and buttermilk produce a decided laxative effect in many persons, especially children.

Fats

Oils and fats stimulate intestinal action. Not only fats themselves, but the glycerin and soaps which are formed by the digestion or decomposition of fats in the intestine, are very active stimulants of intestinal movements.

Mineral oil—white Russian paraffin oil—being indigestible and unabsorbable, is a very powerful stimulant of intestinal activity. It adds to the bulk of the food, lubricates the food canal, hinders the excessive absorption of water, and keeps the bowel contents moist.

Gases

The carbonic acid gas and other gases formed in the intestine by the fermentation of starch, cellulose, and other foodstuffs are powerful stimulants to the muscular activity of the bowel. When present in excess, gases cause spasm of the circular muscles of the intestine, with sharp colic pains.

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COLON HYGIENE

Eating

The taking of food into the stomach is by far the most powerful of all the natural stimulants of the intestine. Very soon after food enters the mouth, peristaltic movements begin in the stomach, and quickly extend the whole length of the food canal. This is the reason for the desire to evacuate the bowels which most people experience soon after eating breakfast. The peristaltic waves set up carry the feces down into the rectum, and this produces the sensation which indicates the necessity for evacuation.

It has been shown that even the smell of agreeable food is sufficient to cause increased intestinal activity. The act of swallowing also excites intestinal activity.

X-ray examinations show that the intestinal contents move four times as fast during a meal as during the interval between meals.

It is the opinion of the writer that bowel movements should occur after each of the principal meals of the day. This question is discussed further in a later chapter.

Psychic Influences

Pleasurable emotions and excitement have been known to produce intense activity of the intestine, and even diarrhea, while depressing emotions have the opposite effect. This has been clearly demonstrated experimentally in animals as well as clinically in human beings.

Electricity

This powerful agent may be applied in such a way as greatly to stimulate intestinal activity. The most effective method is the application of the sinusoidal current to the rectum and abdominal muscles, or to the rectum and the central portion of the back. An-

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other very effective method, perhaps the most effective of all methods, is the application of a bi-polar electrode to the inner surface of the pelvic colon, which is the point of greatest delay in the majority of constipated persons.

Mechanical Vibration

Powerful mechanical impulses may be communicated to the intestines and the nerve ganglia which control them, by suitable apparatus. The writer has in numerous instances seen strong intestinal movements set up by this form of stimulation.

Massage

This is another valuable means of stimulating the bowel to increased activity. Kneading with the hands or with a suitable mechanical appliance has been shown to be capable of quickening the movements of the intestines, if applied with sufficient thoroughness.

Stroking, or reflex titillation of the skin, stimulates the bowel in much the same way that tickling the soles of the feet may give rise to powerful contractions of the muscles of the legs. To be effective, massage intended to influence the intestinal movements must be given by an expert.

Abdominal Compression

This method acts upon the intestine by increasing the intra-abdominal pressure. It is most effective when applied in cases in which the abdominal muscles are weak and relaxed.

The compression may be made continuous by the application of a tight abdominal bandage; or intermittent pressure may be applied, if desired, by means of an inflated rubber bag. These measures will be explained more fully elsewhere.

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COLON HYGIENE

Exercise

Bodily activity is another way of mechanically stimulating the intestine. Vigorous exercise sets the diaphragm and abdominal muscles at work in such a way that the intestines are, between the two, vigorously kneaded and squeezed and thus stimulated to action.

Every farmer knows the constipating effect of idleness upon his horses and cattle. Most observing persons have noted in their own experience the advantage of taking a brisk walk before or after breakfast.

The sedentary man or woman not only loses the immediate benefit which results from the increased activity of the diaphragm and abdominal muscles, but his abdominal muscles become permanently weakened, relaxed, lacking in tone, and incapable of supporting the intestines in their proper place, thus adding a number of other factors which contribute very materially to the lessening of intestinal activity.

Posture

A stooped or relaxed posture in sitting or standing tends strongly to induce constipation by weakening the abdominal muscles and causing congestion of the liver and all other abdominal organs. The viscera, over-filled with blood, and lacking the support of the abdominal muscles, become prolapsed. The colon falls with the rest; kinks are formed; the intestinal contents stagnate; the bowel becomes distended; the ileocecal valve becomes incompetent, infection travels up the small intestine, and a long list of ills result. The check valve action of the ileocecal valve is essential to the onward movement of the food residues, and therefore the crippling of this valve naturally leads to constipation.

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An erect posture secures proper exercise of the muscles of the trunk, correct breathing, normal circulation of blood in the viscera, and promotes in a high degree normal bowel movement.

Hot and Cold Applications

Cold applications, and even extremely hot applications, act as powerful stimulants to the intestinal muscles. To be effective, the applications must be short and intense. The cold spinal and abdominal douche, and the cold douche to the feet and legs, are the most effective external procedures.

The application of cold water to the bowel by means of the enema at a temperature of 75 to 40 degrees F. produces almost instant contraction of the bowel. The action is so intense that great pain may be produced, especially if a very low temperature is employed.

Med.

COMMON COLDS

W. C. Rucker, U. S. Public Health Research Bureau.

The subject of common colds, while perhaps trite, is none the less important. Every physician is constantly being consulted on this constantly prevailing indisposition, and any helpful suggestion along the line of prevention or quick relief is of necessity worth while.

The most prevalent illness in the United States is the common cold, a disease group included under one name and considered of such minor importance that vital statistics do not record the enormous number of persons who annually are subjected to suffering, inconvenience, and economic loss thereby. Remarkable as it may seem, the widespread familiarity with this condition has bred a con-

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tempt which hides its seriousness, yet when the sum total of the ravages committed by common colds is made it becomes evident that instead of being a group of trivial affections common colds must be classed as serious diseases.

The phrase "common colds," like "charity," covers a multitude of sanitary sins, and curiously enough the name has been applied to a group of affections which, far from depending absolutely on cold, are frequently the direct result of living in close, overheated surroundings, having a lower relative humidity than the driest desert known to man.

The word "colds" means an acute infection of the lining membranes of the nose, tonsils, throat, and larger bronchial tubes. The process may be even more extensive and amount to a general infection of the entire body. All of the breathing apparatus, excepting the smaller terminal portions in the lungs, may be involved, and as a matter of fact the disease may, and often does, spread to these, thus producing pneumonia. In this connection it may be pointed out that pneumonia kills more people in the United States than any other disease excepting tuberculosis and heart disease. Many pneumonias begin as a common cold. Colds do not produce tuberculosis, yet unfortunately what is considered as a cold may be in reality the first symptoms of the white plague.

The causes of colds are multiform and not entirely understood. In every case, however, they are dependent upon the growth and activity of living germs which are always received from other people. It is true that almost everybody harbors disease organisms in the mouth and nose, and that these under favorable conditions will produce a cold in their host. But these germs in every case were received from some other person. In other words, colds are infectious. It used to be thought that sitting in a draft or a prolonged

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stay in the swimming pool would produce a cold. This is erroneous, but the chilling of the body which the draft produces and the weakening of the vital forces caused by too long a swim lower the powers of resistance and permit germs which have hitherto been harmless to their host to produce their disastrous effects.

It is not necessary to describe a cold. Everybody is familiar with it in all its variations, from the simple, ordinary coryza, which is a polite running at the nose, to the sore throat, the aching chest, fever, and generally "knocked-out" feeling. The cough, the sneeze, the headache, and the varying degrees of inefficiency which a cold produces are, alas, only too well known. Common colds occur in epidemics and are distinctly contagious. They sweep through an entire household, an entire city, an entire state, attacking the young, the adolescent, the middle aged, and frequently carrying off the aged, the weak, and the debilitated. Schools, factories, stores, are suddenly crippled by epidemics of this sort, and the complications and serious disorders following the disease add to the great economic loss produced in this way. Infection of the cavities beneath the cheeks and brows, ear derangements, chronic lung infections, rheumatism, heart disorders, kidney impairment, and depressed vitality may all follow in the train of this widespread infection.

To prevent a cold it is necessary, first of all, to keep the body resistance at a high point of efficiency. This means that the body machinery should be kept in good order at all times. Good wholesome food in proper amount, plenty of sleep, the careful attendance to the voiding of the body wastes, the taking of regular exercise in the open air, keeping the body clean, keeping the mouth and nose clean, the avoidance of hot, stuffy, dusty rooms, the avoidance of exposure to sudden changes of temperature, the prevention of the chilling of the body either by cold or wet, are all protective

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measures. It should be borne in mind, however, that even robust persons may contract colds from people who have them.

The germs of colds leave the body in the secretions of the mouth and nose. They enter the body through the same route. Thus a careless sneezer and the person who does not cover his mouth and nose when he coughs are breeders of these infections. The little living bodies which cause colds are so small that a million could rest on the head of a pin. When a person coughs or sneezes a fine spray, carrying with it untold numbers of these germs, is spread into the surrounding atmosphere to a distance of several feet and may be easily taken into the mouth and nose with the respired air. More direct contact, such as by kissing, the common drinking cup, the common roller towel, by pipes, toys, pencils, fingers, food, and other things which have been contaminated by the mouth and nose secretions of a person having a cold may also carry the disease.

It is an obligation on the part of persons having colds to see to it that they do not spread these colds to somebody else. The person who neglects to cover his nose and mouth when he sneezes and coughs, the careless spitter, the person who permits his germ-laden discharges to contaminate things which are going to be handled by other people, is a menace to the community. If such a person uses public swimming pools, if he is not amenable to reason and persists in distributing his infection, he should be avoided as a spreader of pestilence.

A good deal has been said about hardening people so that they will not contract colds. There is an element of danger in this, since to expose a weak person to the rigors of cold baths and cold drafts is apt to lower resistance, thus favoring the very condition which it is desired to avoid. At the same time it should not be forgotten that the Arctic explorer does not ordinarily have colds so long as he stays out in the open, and that it is not the engineer and fireman in the

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cold, drafty cab who have colds, but those who ride in the close, dusty, overheated coaches behind. When all is said, it must be admitted that dusty, unventilated rooms perhaps play the greatest role in producing colds.

Since colds are a serious condition they should be treated as such. A great many people think that they have an infallible remedy for breaking up a cold. This may be harmless in itself, but usually it is not, and consists of a combination of harmful drugs and alcohol, the latter usually preponderating. The sufferer takes these preparations in large quantities, and if he is strong enough he may survive them and eventually get the best of his cold. Self-medication or medication by untrained persons is always dangerous. It is especially dangerous to those having colds and should always be scrupulously avoided. As a rule, much time, inconvenience and suffering will be obviated by consulting an intelligent physician promptly. If this is not practicable, a brisk saline may be taken and the patient put to bed. This gives his body an opportunity to regain its vitality and at the same time isolates him from other people. The sick-room should be well ventilated and the windows so opened as to keep the air moving freely. It is also wise to moisten the air a little bit by putting a pan of water on the radiator or over the register or on the stove. The handkerchiefs and bedding used by the patient should be sterilized by boiling. Kissing, and the use of drinking cups and towels, etc., in common with other members of the household should be forbidden, it being borne in mind constantly that colds are infectious and readily spread from one person to another.

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Surg.

CONSTIPATION

Plication of the Cecum in the Treatment of Constipation. (Die Plikation des Coecum als Behandlung der Obstipation.) Dr. C. ten Horn. Zentrallbl. f. Chir., Leipzig, No. 19, 854-856.

In patients suffering from chronic constipation and whose cecum was abnormally large, the author narrowed the cecum by sewing the anterior and lateral taenia together for about 10 to 16 centimeters. Many of the patients had regularly used purgatives or had diarrhea alternating with constipation. The operation was unexpectedly successful in all these cases.

Surg.

CONTRACTION RING

Labor, Delayed
Contracted Pelvis } Contraction Ring

The Significance of the Position of a "Contraction Ring." C. D. Lochrane, M.D., F.R.C.S., British Med. Jr.

A ring of contracted uterine musculature is liable to form in the region of the junction of the upper and lower uterine segments in delayed labor. In delay due to contracted pelvis in vertex presentations, a ring may form which is found constricting the fetal neck more or less closely and imprisoning the fetal trunk and limbs in the upper segment. This is probably not a true "retraction ring" of Bandl but a "contraction ring" due to local spasm of the uterine muscle. This spasm is brought about by excessive manipulations in efforts to deliver. Associated with a markedly contracted pelvis, this condition gives rise to serious situation. It becomes impossible to deliver the head upward by Caesarean section or the trunk per vaginam.

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CONTRACTION RING

Treatment is discussed under five possible procedures:

1. Craniotomy alone.
2. Craniotomy with embryulcia.
3. Caesarean section alone.
4. Caesarean section after craniotomy.
5. Caesarean section after craniotomy and decapitation.

Obviously 1 and 3 would not do. In spite of morphine and deep narcosis these rings will not relax as a rule. The second method might allow delivery if the pelvis is not too small and surroundings are not favorable for operation. The possible difficulties of a preliminary decapitation through a contracted pelvis must be thought of in considering method No. 5. Preliminary craniotomy, and then Caesarean section with decapitation from above, if necessary, and subsequent withdrawal of the crushed head from below seems to offer the best solution. Should the fetus, by chance, be alive and conditions favorable, effort should be made to save it by a Caesarean section with rapid internal incision of the ring.

If the patient has been "handled" to any extent, hysterectomy should be done.

Two cases in the author's experience are cited, and one of these reported in detail. Although a large dose of morphine had been given and the patient was deeply anesthetized, much difficulty was experienced in extracting a well broken up head through the ring from above. Hysterectomy was done and the patient survived though there was marked sepsis.

The writer suggests that the moral is prevention. Pelvic measurements and determining the fit of the fetal head in the pelvic brim before labor are urged as prophylactic means.

[EDITORIAL COMMENT—In this connection it might be of interest to quote from a case report by Albeck (Ugeskrift for Laeger). The

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CONTRACTION RING

placenta was retained and investigation showed a tight contraction ring. On introducing the hand into the uterus the ring grasped the wrist so tightly that the hand was numbed. The placenta was removed manually because of continued bleeding. Gammelhoft, in reporting twenty-three cases of contraction rings, cites only one case where the condition led to retention of the placenta.]

Med.

DIABETES

Experiences in the Treatment of Diabetes During the War. (Kriegslehren zur Diabetesbehandlung.) Dr. G. Rosenfeld. Zentralblatt f. inn. Med., Leipzig, No. 16, 249-253.

The theories concerning diabetes treatment have during the war been considerably shaken. Formerly it was held that bread, potatoes and beets were most harmful in the dietary of diabetics, and yet the blockade against Germany compelled diabetes patients to adhere chiefly to such a diet and to abandon meat, eggs and fats. In spite of this fact the mortality of diabetics greatly decreased during those years in which the patients had to give up the usual diabetes diet. In Breslau the mortality from diabetes was during the years 1913, 1914 and 1915, 328, but during the years 1916, 1917 and 1918 only 201. In Berlin the mortality was during the same years 1,259, and 772 respectively. The statistics of other cities show a similar decrease in the mortality from diabetes. These facts show that diabetes need not be treated exclusively by a carbohydrate-free diet (fats and albuminoids) but that a carbohydrate diet may be just as useful as was shown even before the war by the oats cure. But besides this these statistics point to one important factor in diabetes treatment, namely that reduction in the amount of food is an important means of reducing the sugar in the urine.

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Med.

DIARRHEA

Infantile Diarrhea and Vomiting. G. Douglas Sherwood, M.B., B.C., Cantab., London Lancet.

At this time, when our country is faced by the urgent necessity of repairing the ravages of war, any subject bearing upon the preservation of infant life becomes of the utmost importance. The object of this paper is to show how those distressing and dangerous complaints, diarrhea and vomiting, may be controlled in the nursery by a régime of cleanliness as nearly allied to that of the operating theater as the conditions will allow. Having access to the records of a home for children where these principles were put into practice, I have had good opportunity of studying the results of their adoption.

The Causation of Diarrhea and Vomiting

The great majority of the diseases of infancy and childhood are caused by bacterial infection. At the same time opinions expressed in textbooks as to the infective nature of infantile diarrhea are very divergent, while the infectivity of vomiting receives practically no attention. I intend therefore to deal first with diarrhea and its treatment, and afterwards to produce evidence of the infective quality of vomiting and to describe the management of such cases.

The following authors may here be quoted to show the divergence of opinion mentioned above.

Ralph Vincent states: "Epidemic diarrhea is in no sense of the word an infectious disease and cannot be conveyed by contagion."

Frederick Taylor and earlier writers make no mention of infection, but attribute the disease to a variety of causes such as food and teething.

Savill attributes it to various causes, but does not specify infection particularly. Holt gives five forms of diarrhea, the fifth being

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headed, "Diarrhea of Infective Origin," under which head he says: "The source of infection may be from without, bacteria being introduced with the food or water or accidentally; or it may be from within, where the non-pathogenic bacteria normally or frequently present in the intestines develop pathogenic properties."

Osler, in a paragraph on the relation of bacteria to enteritis in children, says: "In infantile diarrhea the number of bacteria that may be isolated from the stools is remarkable. Brooker has discriminated forty varieties, the greatest number of which were found in cases of cholera infantum. The two constant forms noted above (*Bacterium lactis aerogenes* and *Bacterium coli commune*) do not disappear in the diarrheal stools. No forms have been found to bear a constant or specific relation to the diarrheal feces, such as the two above mentioned due to the healthy milk feces; the bacteria of the proteus group are most frequent, and possess pathogenic properties. All the varieties develop and produce important changes in the milk, which have been dealt with fully by Brooker in his exhaustive monograph (Johns Hopkins Hospital Reports, vol. vi.). This author concludes that in the diarrhea of infants not one specific kind, but many different kinds of bacteria are concerned, and that their action is manifested more in the alternation of the food and intestinal contents and in the production of injurious products than in a direct irritation upon the intestinal wall."

Eric Pritchard says: "The commonest cause of diarrhea is the development within the bowel of an abnormal bacterial flora."

Ballard considers that the essential cause of diarrhea "is intimately associated with the life process of some micro-organism not yet detected, captured, or isolated."

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DIARRHEA

Investigation of Results of a Strict Regimen

We have, then, a variety of opinions on the subject. The records of the home mentioned above (Upwick Vale Home, Eastbourne), opened in 1892 and continued until 1916 (25 years), where an average of seventeen infants, from one month to two years old, were lodged, fed, and clothed every year, show that in the first three years diarrhea was seldom absent, and six deaths from that cause occurred. For the remaining twenty-two years no case of diarrhea originated in the home, and there was not a single death from that cause. How can this remarkable change in the incidence of the disease be accounted for? During the third year a very strict system of dealing with the children was established and rigidly adhered to, with the exception of certain occasions mentioned later. This system was as follows:

All new cases were isolated on arrival until such time as it was certain that their motions were normal. A special room, provided with washing apparatus and slop sink, was set apart to which all babies had to be taken whenever the napkins required changing, and the room was regarded as much as an unclean place as the w. c. used by the adults. As the napkins were removed and placed immediately in a disinfectant, the nates were washed and bathed with a disinfectant, the nurse washed and disinfected her own hands and those of the child, and then put on the fresh napkins. A special nurse was detailed for this duty, and she was not allowed to take part in the preparation and distribution of food to the children. The food was kept in a larder and was not allowed in any room used by the children except at meal times. The food up to eight months consisted of whole milk, water, and sugar, mixed in proper proportions and sterilized. After eight months, or even earlier, bread, oatmeal, potatoes, gravy,

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skimmed milk, and dripping and bread were given. Orange juice was given regularly, when the antiscorbutic and growth-encouraging properties of fresh fruit became known, though their use was empirical at that time. The mothers were provided with a basin of disinfectant for use at night when changing the napkins and before feeding the baby.

From the time of the establishment of this system, apart from new admissions, there was absolutely no diarrhea in so far as the system was rigidly adhered to. On two occasions a temporary matron allowed some relaxation of the rules, when diarrhea at once appeared. On this being discovered the rules were again strictly enforced, and within seventy-two hours the diarrhea disappeared. No form of medicinal treatment beyond an initial dose of castor oil was found necessary.

In the cottages attached to the home, where infants from two to five years old were sent, the same routine was observed though the supervision was not so strict. Only one epidemic of diarrhea started there, and on investigation it was again found that some relaxation of the rules had been allowed, and the children were attending to themselves after defecation. The children were at once paraded, and it was found that all the clothes that came in contact with the nates were soiled with fecal matter. The soiled clothes were taken away and new provided, and the system of washing and disinfection again established. The epidemic stopped absolutely in forty-eight hours, with no other physic than a dose of castor oil.

Here we have surgical cleanliness applied to the nursery for the prevention and treatment of diarrhea, with the result that diarrhea is stamped out without the aid of drugs.

From these facts we can but conclude that the diarrhea of infants is not only infectious but autogenous, and that by the enforce-

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ment of surgical cleanliness and isolation of duties it can be avoided and checked.

Having come to this conclusion, after a brief summary of the system, it may be well to consider some of its chief points in detail. These points are five in number. They are:

1. The food was kept in a larder and, except at meal time, was out of all contact with the children and their service.

2. A separate room was used for the changing of the napkins and, where possible, a separate nurse for toilet.

3. The nates were washed and bathed with a disinfectant.

4. The nurses' and babies' hands were disinfected.

5. The napkins were immediately placed in a disinfectant.

The significance of (1) is self-evident, and would be hardly worthy of note were it not that babies' food is so frequently exposed to the risk of contamination.

With regard to (2), though the adult is provided a w. c., the infant has frequently to use its combined larder, living room, and dining-room for the purpose, and hence has an ever-present source of infection.

(3) and (4) I have not been able to find any author on this subject or on medicine in general who has pointed out the fact that, with no more than the usual precautions taken in the cleansing of the nates after defecation, whether in the adult or the infant, and, however carefully carried out, the odor of feces can be detected on the hand used. This is true in the case of the infant even if the greatest care is taken by the nurse, when removing and folding the napkins, not to bring her hand in the least contact with fecal matter which may be visible on the napkin. It may also be observed that wherever the napkin is placed even for a few moments, with whatever care taken that no visibly contaminated part comes in contact with

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the surface on which it rests, this surface takes up the odor of feces. The hands of the nurse as soon as she touches the napkin to remove it become a source of infection, as may any part of her dress which may come in contact with them. Infection from these sources may reach the food or mouth of the infant. To wash the hands is easy and therefore insisted on, but to change the dress every time the napkin is changed is asking too much of the nurse; hence she must not come in contact with the infant's food. The baby's hands need washing not only after it has its napkin changed but at frequent intervals, as it is by them that septic matter most frequently reaches the mouth.

(5). The significance of placing the napkin in disinfectant is, to my mind, of great importance, apart from the fact above mentioned, for reasons based on the opinion of some competent authors on the etiology of the disease. Ralph Vincent says: "The disease is most prevalent and most fatal in the third quarter of the year; the higher the temperature of the late summer the greater the prevalence, particularly if high temperature be associated with little rain." Ballard states that "the essential cause of diarrhea resides ordinarily in the superficial layers of the soil, where it is intimately associated with the life-history of some micro-organisms; . . . . . that the vital manifestation of such micro-organisms is dependent, among other things, perhaps principally, upon conditions of season." Holt tells us that "Observations in a large New York dispensary extending over ten years showed an enormous increase in diarrhea, rising from February (289 cases) to July (12,468) and falling by the middle of October (1723)."

These statements are in accordance with the commonly observed rule that infantile diarrhea is more frequent in the hot months. During the hot dry months the fecal matter is more rapidly dried

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and reduced to dust, which is easily disseminated by draught and wind. It is obvious that the disease may become more widespread in the summer months. It may be noted in this connection that Ballard remarks that "such micro-organism is capable of getting abroad from its primary habitat, the earth, and having become air-borne, obtains opportunity for fastening on some non-living organic material." It is possible, in view of the above arguments, that the earth is not the original habitat from which the micro-organism becomes air-borne.

Conclusions as Regards Diarrhea

Considering again the relative importance of the five points given above, we see that the larder is but a means of preventing contamination of food by germ-laden dust and flies, and hence infecting the child; the separate room is but a matter of treating the child with the same decency and care as is meted out to the adult. If the washing of the hands and nates were neglected, though the neglect would leave open a grave source of infection to the *individual* child, in the hot dry months the nates and hands are always damp to a greater or less extent with perspiration, and hence the faecal matter does not so readily dry as to form a great danger to others. But the placing of napkins in disinfectant puts the largest and most easily dried source of infection of the community in general completely out of court, and it is for this reason that I consider this point of greater importance than the others as far as the safety of the many is concerned. It is interesting here to note that Holt states that "the enormous increase in the number of cases occurring in the summer months does not have reference to any single form of diarrhea, but to all forms"—a conclusion which, I think, adds emphasis to this point, since the dried fecal material will disseminate many micro-organisms that inhabit the bowel.

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DIARRHEA

Vomiting

Having considered in detail the system as applied to diarrhea, the similar system adopted at the home for the management of vomiting may now be considered. I do not refer to the simple regurgitation of almost unaltered food due to repletion, but the foul, acid vomiting which is so dangerous to the child and distressing to those who have the care of it. The system was as follows:

Any child vomiting acid vomit was *immediately* removed from the nursery by the person noticing it and taken to an isolation room; its clothes were removed and the child bathed completely. When this had been done it was put into clean clothes. No milk was given for several hours, and the mouth was washed out at frequent intervals with a solution of borax in water. This sterilization of the mouth is essential, as otherwise the infected mouth would infect the sterile milk.

A further possible source of infection was the spots of clean milk which get unavoidably splashed on the child's clothing during feeding. As a prophylactic measure, when the children's clothes were laundered they were, before being ironed, rinsed in borax and water; this precaution is particularly necessary in the case of bibs.

The use of this system provided a means whereby this dangerous complaint was held completely in check. Considering that the means used were those employed for the avoidance of bacterial infection and that they were effective, it may be urged that this is an indication of the infective nature of the disease.

In connection with this point the possibility of the parent or nurse as a source of infection has to be considered. It seems horrible to suggest that any of these people may be a cause of so dangerous a complaint in their offspring or charge, but unclean hands or

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face, a foul mouth, or otorrhea, may well cause a disaster to the child. A case in point arose at the home. A child arrived in a pitiful condition due to gastric and intestinal disturbances, and in course of the routine was isolated and placed under the strict system of the home. As the child did not benefit in the usual manner, all possible causes for the persistence of the trouble were investigated. It was found that the mother was devoted to the child and was constantly kissing it. When examined she was found to have a mouth full of carious teeth. A promise was extracted that she would not kiss the child, and her teeth were attended to. The child's rapid recovery was the sequel.

If the result of the system as a whole is not proof of the infective nature of the diseases under consideration, this case gives proof of it as nearly as possible without bacteriological investigation.

Surgical Cleanliness Adapted to the Nursery

Here, then, we have a system, for the principle governing that for diarrhea and vomiting is the same, which controls two of the curses of infancy, and it is nothing more than the adaptation of surgical cleanliness to the everyday life of the nursery. It may be objected that the trouble involved renders the system inapplicable to the private patient. But of all people the private individual needs most training in the principles laid down in this paper. Of modern institutions which deal with babies, the great majority have trained nurses or matrons who insist on a standard of cleanliness in dealing with the babies being maintained. But in the home circle it is surprising what negligent and disgusting habits are indulged in. Who has not seen the mother or nurse who sucks the nipple of the bottle or comforter before giving it to the child? And there is the still more disgusting practice frequently used, though rarely in public, as the

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other is, of inserting the finger into the napkin to ascertain if the baby has passed water or defaecated, after which, whether the answer is in the affirmative or negative, the hand is by no means always washed before it handles the bottle or breast to feed the baby. These and similar practices, such as the above system is designed to combat, are used frequently in the lower classes, and are by no means entirely absent in the better class nurseries.

Experience shows that if it is explained to those in charge of the child that such practices may start disease, and that the adoption of the system, though apparently a troublesome one, may really be a saving of trouble and danger in the end, it is gladly adopted and soon becomes a matter of routine.

Its apparent effect on the death rate from all causes is notable. I have worked out figures for comparison to the best of my ability from the figures given in the last Registrar-General's (1916) Report for Infant Mortality in the whole of England and Wales for the years 1892-1916—taking, that is, the years during which the home was open. I have been unable to get the exact number of infants in the home for the first three years separate from the remaining twenty-two years during which the system was in operation. The total number for the twenty-five years was 433—that is, an average of 17.35 per annum. For the whole of England and Wales in those years the deaths averaged 13.2 per cent. per annum from all causes, while in the home they were 7.8 per cent. The deaths in the home during the first three years amounted to 0.41 of the total for the whole twenty-five years, and were only included owing to the difficulty of separating the numbers in the records. Had they been omitted, the percentage for the twenty-two years during which the system was in operation would compare still more favorably with that for England and Wales. Also it must be borne in mind that the

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DIARRHEA

deaths from diarrhea for the last twenty-two years were nil in the home, while the Registrar-General's figures work out at 2.25 per cent. for the whole of England and Wales.

If, then, it is possible, and I have shown it is possible, to apply the system to the everyday life of the nursery, two of the many great dangers to infant life will lose their terrors.

Med.

DIGESTIVE DISEASES

Alleviation of Distressing Digestive Symptoms in "Cardiorenal Disease." George M. Niles, Ph. G., M. D., (Jour. of A. M. A.).

All practitioners of medicine, particularly those specializing in gastro-enterology, have patients with so-called "cardiorenal insufficiency" who complain of indigestion, of distressing flatulence, of sensations of epigastric fullness after eating, and of general feeling of digestive discomfort. These patients may present valvular lesions in various stages of compensation: there may be arrhythmia or myocardial inefficiency or tumultuous heart action. The urine may be loaded with albumin, may show granular or hyaline casts or both, or at times it may be fairly normal. The questions of actual cardiac and renal pathology will not be discussed in this study, but rather the methods of steadying the heart's action, of aiding compensation, of allowing more physical space to the thoracic and abdominal organs, so that they may be less handicapped in performing their functions, and of lightening the work of the kidneys.

As a cardiac "steadier" plus a diuretic, I have much confidence in the *infusion* of digitalis—more, perhaps, than in any other preparation of this drug. However, the infusion must be fresh and must be made from fresh and dependable digitalis *leaves,* otherwise the

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results will be disappointing. It is my custom to give one-half ounce, four times the first day, especially if the pulse is accelerated. After that I have found 2 teaspoonful doses, four times daily, a sufficiency. It is well to omit it altogether every fifth day, and if the pulse becomes rather slow, to omit it every fourth, or even every third day. This minimizes the danger of a cumulative effect. Unless the bowels are loose, which is seldom the case, I employ, with good effect, this prescription:

℞ Magnesii sulphatis
Potassi bitartratis (C. P.) ..... āāʒiii
Triturate finely.
M. Sig: Two teaspoonfuls in one-half glass of water on arising.

This prescription should produce two or three free watery stools, but the dose may be varied to obtain that result. In some instances, when the watery movements seem to cause debility, this prescription may be given on alternate mornings, or even three days apart.

For the distressing accumulation of gas in the stomach, which so embarrasses the heart's action, this prescription has proved most helpful:

℞ Spiritus anisi ..... ʒii
Zinci phenolsulphonatis ..... gr. xv
Magmae magnesiae ..... ʒiiss
Aquae ..... q. s. ad. ʒiv
M. Sig.: One teaspoonful every fifteen to thirty minutes as needed for gas.

This can be repeated almost ad libitum. It can produce no bad effect, unless the magnesia acts as a hydragogue cathartic, and generally it promotes the free expulsion of the disquieting gas, of which the patient complains so bitterly. In many of these uncompensated cases there is frequent dyspnea, coming on after slight exertion or

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without apparent cause, or deepening in intensity during the hours of night.

The following combination, while it unfortunately possesses an odor both foul and fierce, has to many sufferers under my observation afforded a most grateful surcease for this distress:

R Spiritus ammonii aromatici
Elixir ammonii valerianatis.....āā ℥iss
M. Sig.: One teaspoonful in water every fifteen minutes to one hour as needed for difficult breathing.

This, like the previous prescription, may be repeated quite a number of times.

Dietetic restrictions and regulations are most important, as they tend to diminish intestinal flatulence, to encourage intestinal peristalsis, to lighten the eliminative burden of the kidneys, and to promote general nutrition.

In the suggestive dietary herein offered, it will be noted that sweets and fats are avoided, so far as possible, and that vegetables containing only five and ten per cent. of carbohydrates are allowed, while the starchy foods are for the most part prohibited. Fresh lean meat may be eaten freely, but must be broiled, baked or roasted. The string beans, squash, onions, turnips, etc., may be cooked, but the green vegetables, usually eaten raw, may be cut up into a combination salad and flavored with lemon juice instead of the ordinary condiments. A limited amount of fresh buttermilk is admissible, and a small amount of cereal for breakfast, if the patient insists on it, as sometimes is the case. When cereals are eaten, a very scant amount of sugar may be permitted.

Suggestive Diet List

Foods Allowed. Lettuce, cucumbers, spinach, asparagus, sauerkraut, beet greens, greens (turnip, mustard, or collard), celery,

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tomatoes, brussels sprouts, okra, cauliflower, eggplant, cabbage, radishes, leeks, onions, string beans, pumpkin, turnip, squash, beets, carrots, ripe olives, grapefruit, lemons, oranges, unsweetened pickles, clams, oysters, liver, roe, lean fresh meat of any kind, as beef, mutton, pork, chicken, fish, or game, coffee or tea as sparingly as possible, and fluids, only enough to quench actual thirst.

Foods to Avoid. Sweets of all kinds, fats, as fat meat, butter and cream, sweet milk, eggs, and starchy foods, as breads, rice, grits, potatoes, dried beans or pears and macaroni.

This diet will seem quite a revolutionary change to many patients, and some will for a while complain at the prohibition of breads and sweets especially. In a short time, however, in a majority of cases, the intestinal flatus will markedly diminish, the dyspnea will lighten, the heart will become more steady and efficient in its action, and the albuminous content in the urine will lessen or entirely disappear.

This dietary does not promote a gain in weight. On the contary, there is generally some loss; but this is not prejudicial to the invalid's welfare. As general improvement progresses, certain variations or modifications in the daily regimen may be allowed; but any inclination to increased dyspnea or inefficient heart action should indicate the necessity for a prompt return to the strict diet and regular medication.

There will, of course, be found some persons who lack the mental stability required for the successful advancement of this method; then, too, there will be found both hearts and kidneys seemingly beyond the power of compensation or recuperation.

Nevertheless, in a liberal proportion of these melancholy and long suffering "cardiorenal cases," the brief, but practical suggestions herein offered will be found decidedly helpful.

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Med.

DIPHTHERIA CARRIERS

Paralytic Manifestations in Diphtheria Bacillus Carriers. (Ueber Lähmungen bei Diphtheriebazillenträgern.) Dr. M. Gerson. Berlin. klin. Wochenschr, No. 12, 274-277.

Dr. Gerson reports nine cases in which he observed paralysis of various kinds, of the eye muscles, of the muscles of deglutition, of one arm, of one or both legs, etc., for which he could not discover any apparent cause. On making a bacteriological examination of the nasal secretions he found that all these patients were diphtheria bacillus carriers. It is a well known fact that in acute toxic forms of paralysis the diphtheria toxin plays an important role as has been proved by Guillain and Laroche. In all nine cases the bacilli were found in the nose and none in the throat. All these cases were cured after they had been freed from the bacilli. The treatment consisted in frequently swabbing out the nose with tinct. of iodine and in gargling the throat with hydrogen peroxide. If after six weeks no bacilli could be detected any more 12-15000 units of diphtheria serum were administered on three successive days. The taking of the diphtheria serum always caused an aggravation of the paralytic symptoms but they soon disappeared entirely. In severe cases the serum may be injected subcutaneously.

Med.

DRUG ADDICTIONS

Treatment of Drug Addictions. (A. D. Greenfield, U. S. Public Health Reports.)

It is not the function of the Public Health Service to pass upon the merits of the various methods of treating narcotic drug addiction, but in view of the recent decisions of the United States Supreme Court, a digest of which has been published in Public Health Re-

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ports, it seems desirable that the medical profession should be advised at least to the extent of aiding its members to determine what does and what does not constitute legitimate professional practice. The court having decided that narcotic drugs may not be prescribed or dispensed to an addict except for the purpose of cure, and one of the recognized methods of curative treatment being the reduction method, which consists in tapering off the dosage until the patient is "off the drug," while various other methods involve the maintenance of a certain dosage during a period in which the patient is prepared, by other medication, for abrupt or rapid withdrawal, it is important that physicians should understand to what extent and in what manner the legitimacy of these curative treatments is affected by the recent court rulings.

For this purpose, all methods of curative treatment may be divided into two broad classes—the "ambulatory" and the "institutional." The ambulatory treatment may be defined, for the present purpose, as any treatment in which narcotic drugs are prescribed or dispensed to a patient for self-administration by the patient, so that he has control and possession of the drugs, and is physically free to use them in any manner he desires, regardless of the physician's instructions. The institutional treatment may be defined, for the present purpose, as any treatment in which narcotic drugs, if used at all, are administered by a physician or by a nurse under a physician's direction.

One of the purposes of the Harrison law, as declared by the Supreme Court in the Doremus case, was to prevent the possibility of narcotic drugs being illegally disposed of without payment of the tax and without the use of order forms. Obviously, the use of narcotic drugs under the institutional treatment fully precludes this illegal disposition, while their use under the conditions of the ambula-

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tory treatment, as above defined, clearly facilitates it. The latter form of treatment readily lends itself to abuse by unscrupulous physicians who merely make a pretense of cure, and most of the successful prosecutions of physicians for illegitimate practice under the Harrison law have been in cases where the physicians professed to be using the ambulatory reduction treatment for the purpose of cure.

Investigations have been made of the merits of the ambulatory treatment from the medical standpoint, and it is found that genuine cures have rarely been effected by it. Competent authorities, therefore, feel justified in advising against the use of this so-called method of curative treatment. In so far as the question of legitimacy of medical practice in the treatment of drug addiction depends on the presence or absence of professional good faith, the physician using this method must realize that he places himself in the power of his patients, and that his good faith becomes, to a great extent, dependent upon theirs. Reputable physicians cannot afford to run this risk, except, possibly, in a few rare and exceptional cases. Among the medical objections to the ambulatory treatment are the facts that hypodermic administration by the patient often leads to serious abscesses through lack of sufficient sterilization; that for the same reason, and through common use of a needle by several patients, syphilis and other communicable diseases are occasionally transmitted; and that this method does not give the physician an opportunity to control the amount administered at each dose and the intervals between doses, and thus determine the minimum physiological requirements of the patient.

In order to avoid misunderstanding, two points require mention. One is that by the phrase "narcotic drugs," as used in the foregoing paragraphs, is meant only opium, coca leaves, or any compound, manufacture, salt derivative or preparation thereof, since these

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are the drugs with which the Harrison law deals. The other point is that nothing in the recent court decisions affects the right of physicians to use these drugs in the treatment of disease or pathological conditions other than drug addiction, including the alleviation of pain. If drug addiction becomes necessarily incidental to such treatment, its continuance is legitimate, so long as conditions exist which medically justify it. Addicts may thus be divided into two classes, the legitimate and the illegitimate. As to the former class the rights and duties of physicians are well expressed in an article in the Weekly Bulletin of the New York City Health Department of May 3, 1919, from which we quote the following:

"Every physician must feel free to treat such cases in accordance with his own professional conscience and judgment, and no reputable physician should hesitate to do so. In this, as in all cases with which a physician has to deal, it is his duty to seek the underlying cause of the patient's condition, and direct his treatment to the elimination of that, wherever practicable, rather than to the alleviation of symptoms; many cases of drug addiction owe their origin to professional carelessness in this respect. But where it is not possible to remove the cause, and where its continuance renders necessary or desirable, in the practitioner's honest judgment, the use of morphine, or other narcotic, he need not fear getting into legal difficulties by continuing its use, even though the patient be an addict. In fact, it is highly desirable that patients of this class be freely treated by reputable physicians, rather than be compelled to rely on questionable sources for the relief to which they are rightfully entitled."

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Med.

DYSENTERY, TREATMENT OF

Report of the British War Office Committee on Dysentery, with Recommendations as to the Treatment of Patients Infected with the Entameba Histolytica. (Review of War Surgery and Medicine.)

1. It may be laid down, in the first place, that the only admissible treatment, for patients in whom an amebic infection calls for treatment at all, is one which aims at the complete eradication of the infection.

2. *Treatment with Emetine Essential.* The evidence available indicates treatment with emetine as the only measure likely to effect such a radical cure. Mere palliative treatment, which may assist the disappearance of immediate symptoms, but leaves the patient still infected and always in danger of relapse, must at best be regarded as accessory to the course of emetine.

Emetine itself, if given in insufficient dosage or by unsuitable methods, may act as such a temporary and palliative remedy. For the radical cure, which must be attempted, it is essential that emetine be given in adequate doses over a sufficient period and by appropriate methods.

3. *Emetine Not to Be Given Indiscriminately.* While emetine is the only proved specific for amebic infection, there is no evidence whatever of its having any value in the treatment of dysentery due to other causes. It must be remembered also that emetine is a drug which is highly toxic to man. It has been abundantly proved, both by animal experiment and by clinical experience, that its administration in larger quantities, and over longer periods, than here recommended, may give rise to severe intestinal irritation (which may, in extreme cases, be confused with dysentery), to cardiac weakness, to great prostration, and even collapse. Continuous treatment with

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emetine, regardless of the fact that it is a toxic substance, has probably in some cases caused the death of the patient. The indiscriminate employment of this drug is therefore, in our opinion, most undesirable; and even within the safe limits of dosage here indicated, there is, we think, no justification for its use in dysenteries which are not amebic in origin.

4. *Dosage and Administration.* For controlling the course of the infection sufficiently to cause abatement or disappearance of acute symptoms, emetine hydrochloride given hypodermically appears to be efficacious, though there is no evidence that it acts more promptly when thus administered than when taken by mouth. If it should seem desirable, therefore, it is permissible to begin the treatment of a patient suffering from acute amebic dysentery by a short course of hypodermic injections, the amount given being 1 grain per diem. Experience has shown, however, that even when such hypodermic administration is continued for ten or twelve days, it fails to eradicate the infection in a large proportion of cases; the patients though freed from most or all of their symptoms, remaining carriers of the parasite, and in danger of relapse. If the hypodermic method is used in the initial stages of the treatment it should, to prevent this result, be supplemented by a thorough course of emetine given by the mouth.

The only difficulty involved in administering emetine by the mouth is due to the readiness with which it causes vomiting. Attempts have been made to overcome this difficulty by coating the pill or tablet containing the emetine with some material insoluble in the stomach and only dissolved in the intestine; or by giving the emetine in the form of a compound which is insoluble in the gastric juice, but gradually liberates emetine in the intestine. It may be stated at once that experience during the past few years seems to indicate that no method has succeeded in suppressing altogether the nauseating

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effect of emetine without at the same time compromising and rendering at best, irregular, its therapeutic effect on amebic infection. The so-called "absorption-compounds" of ipecacuanha or emetine with Fuller's earth, such as "Alcresta ipecac," etc., have found favor with some on account of the absence of vomiting after their administration; but their action is apparently uncertain and their use is not, in our opinion, to be recommended. Two methods have hitherto shown a good record of permanent cures:

(i) Wenyon and O'Connor recommend a course of combined hypodermic and oral administration of emetine hydrochloride—1 grain per diem hypodermically and one-half grain per diem by mouth in a keratin coated tablet, for twelve days. The proportion of cures reported is high, but the series hitherto published is small.

(ii) The administration of the insoluble double iodide of emetine and bismuth by the mouth. The proportion of emetine in this compound is not absolutely constant, and it is desirable that a minimum content of twenty-six per cent. of emetine alkaloid should be guaranteed. This is the method which has been given the most thorough trial in the United Kingdom, and the results, when the treatment has been conscientiously carried out, have been such as to lead us to recommend it in preference to other methods.

We suggest, therefore, that for treatment of all patients in the United Kingdom for amebic infection the administration of emetine bismuthous iodide by mouth might be adopted with advantage as a routine, to the exclusion of other methods. Thorough treatment with this compound has proved efficacious in a large series of cases previously treated unsuccessfully with emetine in other forms. It should, therefore, be given to all cases calling for treatment, whether they have previously had emetine or not.

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DYSENTERY, TREATMENT OF

Recommendations have recently been made for the administration of emetine by intravenous injection. It may safely be stated that there are at present no practical or theoretical considerations of sufficient weight to justify the greatly increased risk which this method entails. Emetine, when so given, has a far higher toxicity than when given by mouth or hypodermically, and there is no evidence that its therapeutic effects are better.

5. *Form of Administration and Dosage of Emetine Bismuthous Iodide.* Emetine bismuthous iodide is an almost insoluble powder, from which the emetine is gradually set free by contact with the intestinal juices. It is important, therefore, that such contact should in no way be prevented by the form of administration. The following procedures in dispensing have been shown to render the compound irregular in action or totally ineffective, and should be prohibited:

1. Compression of the powder into a hard tablet.
2. The use of insoluble excipients, such as liquid paraffin, vaseline, or resin ointment. Soap has also proved unsuitable.
3. Coating with keratin or stearin.

The most regularly effective form of administration has been to give the loose powder, without excipient, inclosed in a hard gelatine capsule or paper cachet. If preferred, the powder can be given in jam. If pills are made for convenience in dispensing, they should be made with a simple sirup basis. The trouble due to vomiting is frequently eliminated by coating such pills with salol (which must not be mixed with shellac), but the coating seems liable to become less readily soluble in the intestinal juice if the pills are kept for some time. It seems to us preferable to give instructions that the compound should be supplied as the powder; and medical officers should be told that nausea and vomiting are to be expected during

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the earlier part of the course, and are not to be regarded as diminishing the efficacy of the treatment, but, on the contrary, as an indication that the compound is being properly decomposed and is producing its desired effect. Consistent absence of nausea and diarrhea is usually an indication that the drug is being given in a form which causes it to pass unchanged through the bowel and to lose its therapeutic action.

The dose should be 3 grains of the double iodide per diem, and should be given for twelve consecutive days. Neither shortening nor intermission of the course is allowable if the proper effect is to be obtained. It is, therefore, very undesirable to begin the treatment of a group of patients unless sufficient of the drug is in hand to insure that each of them can receive the full course of 36 grains without interruption. Shortening or intermission of treatment or reduction of the dose increases the proportion of relapses and wastes time in the end.

In order to emphasize the necessity of full and continuous treatment with this compound, we suggest that except when the loose powder is supplied in bulk to be dispensed at the hospital, it should be issued in suitable cachets, capsules, or pills, in boxes or bottles containing 12 doses of 3 grains each. Each box or bottle should bear a label with the indication:

Emetine bismuthous iodide, 3 grains. One to be given every day for twelve consecutive days.

The label should have spaces for the name and number of the patient, and dates of beginning and completion of treatment.

6. *Method of Administration and Symptoms During Treatment.* Patients suffering from acute or subacute dysentery should be sent for treatment to a recognized dysentery hospital, and should be confined to bed during the whole course. In the case of carriers,

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confinement to bed is unnecessary unless the treatment causes vomiting and diarrhea of unusual severity. In all cases, however, it is desirable that the dose should be given to the patient when in bed, and preferably when he has gone to bed for the night. Administration on an empty stomach is not advisable. It is better for the patient to go to bed shortly after a good meal, and then to take the dose with a cup of hot tea. If he can get to sleep before the nauseating effect begins, the trouble is greatly reduced. If vomiting is severe, and especially if it occurs so soon after the drug has been taken as to cause partial rejection of the dose, it may be controlled by giving mX-mXV of tinct. of opii shortly before the emetine.

Administration in bed has the additional advantage that the patient is under control and observation. Many cases have come to light in which patients, who have experienced the unpleasant effect of a first dose, have shown great ingenuity in getting rid of subsequent doses without swallowing them. Great vigilance is sometimes necessary to insure that treatment is not thus evaded. It is well that medical officers in charge of this treatment should realize clearly that vomiting is to be expected, that it does not compromise the success of the treatment, and that many patients become relatively tolerant of the drug after the first few doses.

Apart from nausea and vomiting a looseness of the bowels is the only common symptom during the course. It is seldom so severe as to require any measures to mitigate it. Abdominal discomfort and some general malaise are sometimes reported.

The condition of the heart and pulse should be noted daily, but the treatment should not be abandoned unless depression becomes severe.

Patients with acute or subacute dysentery should have milk diet during the treatment, and after its conclusion the return to normal

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diet should be cautious and gradual. It must be borne in mind that suppression of the infection is not synonymous with immediate and complete restoration of the intestinal mucosa. For carriers no severe dietary restriction is needed even during the treatment, but foods liable to irritate the intestine should be avoided. Alcohol in any form should be prohibited during the course of treatment and until the patient's discharge from hospital as cured of his infection.

During the period of convalescence it is important that the patient should avoid undue fatigue, chills, cold bathing, and excesses of any kind.

7. *The Number of Negative Examinations Which Shall Constitute a "Cure."* If observations are required for the special purpose of testing or recording the results of treatment, then no case should be recorded as "cured" (i. e., freed of infection with E. histolytica) unless at least six negative examinations of the stools have been made, after the completion of treatment, by a competent protozoologist.

The six examinations should be made as follows:

One in the first week after treatment.

One (or two) in the second week after treatment.

Four (or three) in the third week after treatment.

The last examination to be made not earlier than the 21st day after the completion of treatment. Negative examinations made during treatment are never to be counted.

To insure that these examinations are properly carried out it is advisable that the dates on which specimens are due to be examined should be written down for each case as soon as treatment is ended. Samples of feces should then be collected and sent in for examination strictly according to this program. (If, for any reason, a sample is unobtainable on the day when it is due, a sample obtained on the day following may be substituted.)

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DYSENTERY, TREATMENT OF

Whenever this is possible, each case should be examined by the same protozoologist throughout. No case should begin treatment before at least one positive examination of the stools has been made by the examiner who will subsequently be responsible for the negative examinations after treatment. Many mistakes can be avoided by taking this precaution.

The six negative examinations made in this manner only constitute a "cure" in the sense that the case shall be considered "freed from infection." Removal of the parasites is not immediately followed by healing of the ulceration produced by them in the bowel. This should always be borne in mind when considering the clinical after-treatment of every "cured" case.

8. *Treatment of Relapses.* Even the most conscientious application of the above treatment will fail to remove the infection from a small proportion of the cases treated. A further proportion of these can, however, be cured by a second and longer course of the treatment. It is recommended that, when it is considered advisable to give such a second course, this should be a double course—the same daily dose (3 grains) of emetine bismuth iodide being given for twenty-four consecutive days, so that 72 grains in all are given. After-treatment and examinations should then be carried out as after the first course of treatment. Some observations are on record which appear to indicate that a certain proportion (up to 40 per cent.) of cases which have not been cured by two courses of emetine bismuth iodide can be freed from infection by treatment with the infusion of the Mexican drug "chaparra amargosa" (Castela Nicholsoni, Simarubacae). It is suggested that this might be given a trial when further treatment seems desirable of cases which have proved refractory to the emetine treatment. Below are the details of the method as used at a dysentery hospital in the United Kingdom

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where the treatment with chaparra has been extensively tried. A trial at the same center of a similar infusion of Simaruba bark, similarly administered, has given results of the same order, and this might be used if chaparra is not available.

9. *Details of Course of Treatment with "Chaparra Amargosa."* Treatment lasts ten days. Before breakfast on the first day 1 ounce of Mag. sulph. given. Five teaspoonfuls of powdered chaparra are used each day—three for drinks and two for enema. The drinks are given half an hour before breakfast, dinner and supper. The drink is prepared by boiling for a quarter of an hour one teaspoonful of powdered chaparra in eight ounces of water. Allow to cool, and strain, so that clear fluid is given to drink. The enemas are given one in the morning about ten a. m., and one in the evening about six p. m. The enema is prepared in the same way as the chaparra for drinking, except that twelve ounces of water are used instead of eight ounces. Enema given by a rubber catheter attached to rubber tube and funnel. Patient remains in elbow-knee position for at least fifteen minutes after enema, if possible, and retains the enema as long as possible.

Med.

DYSENTERY

Vaccine (Lipo-Dysentery).

Olitsky (Jour. Ex. Med., Vol. XXVIII, p. 69), reports on an experimental study of vaccination against Bacilli dysenteriae. He found saline vaccines too toxic; he found bacteria plus chemicals that neutralized the toxicity; and a combination of vaccines and immune sera possessed inadequate power of stimulating protection. He then used the oil employed by Le Moignic and Pinoy for their typhoid-

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paratyphoid vaccine through a Berkefeld filter. Using this oil as a vehicle for killed cultures of dysentery bacilli, animals were injected, and although immune bodies were a long time appearing in the blood, they were at length present in greater concentration and persisted longer than those obtained in response to any other method of vaccination. No local or systemic reactions were noted.

In experiments designed to determine the best oils for this purpose, olive oil combined with lanolin and a mixture of almond oil and lanolin were excluded because of the severe local reactions caused. Almond oil alone, however, was found to be non-irritating and no general reaction resulted from its use. Immune body production was satisfactory in animals when it was employed as a vehicle for the dysentery bacilli.

After preliminary test on rabbits, monkeys, and human beings a suitable dose of oily vaccine was selected, which was effective when administered in a single injection. The dosage of the neutralized oily vehicle was 0.5 c.c., and this contained two and one-half billion dysentery bacilli, one-half of which were of the Shiga type and the remainder equally divided between the Flexner and Hiss Y types. Agglutinins appeared after seven days and persisted for a month or more in the four individuals receiving this dosage. Local reactions were slight and systemic reactions almost nil.

The nontoxicity of the oily vaccine as contrasted with a similar aqueous one seems to depend on the slow absorption of the organisms from the former. Experiments demonstrated that in subcutaneous injections in rabbits bacteria were present after three days when the oily vehicle was used but were absent after twenty-four hours when administered in aqueous suspension. The toxin secreted by the Shiga bacillus, in suitable media, when injected together with

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the almond oil, as used in the vaccine, is innocuous in many times the minimum fatal dose when injected in aqueous solution.

Experiments on a monkey and later on a man demonstrated that from one to two months after the injection of the oily vaccine neutralizing substances were present in the blood serum.

In preparing the vaccine rectified oil of sweet almonds is used. This is dissolved before use in ether and titrated with sodium methylate against phenolphthalein until neutralized. The neutralized oil is filtered and centrifuged and the ether evaporated by warming. Later animal charcoal is added and the oil is again filtered and autoclaved for forty-five minutes at fifteen pounds pressure. From plain agar, 24-hour cultures, in Blake bottles, the dysentery organisms are washed off in normal saline solution and each bottle shaken separately. After this, counting is carried out according to the Wright technic. Centrifugation for 20 minutes at 1,800 revolutions per minute is practiced and the sediment added to oil in sufficient quantity to give two and one-half billion Shiga and one and one-fourth billion each of Flexner and Y organisms per c. c. After mixing, the vaccine is placed in receptacles containing glass beads and heated to 60 degrees C. for one-half hour. After testing sterility and effects on rabbits it is kept on ice. Before use the vaccine is warmed gently and shaken vigorously and 0.5 c. c. given as a subcutaneous injection over the deltoid muscle. Intracutaneous or intravenous injection is cautioned against.

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Med.

DYSMENORRHEA

X-rays in the Treatment of Certain Forms of Dysmenorrhea; A Plea for Their More Extensive Use. Dr. F. Hernaman-Johnson. Lancet, London, 432.

The type of dysmenorrhea suitable for X-ray treatment presents the following characteristics:

1. The patient is free from gross organic lesions.
2. There is excessive and prolonged bleeding at the menstrual periods, which follow one another with undue rapidity.
3. There is more or less pain of the usual menstrual type and frequently headache and mental depression.
4. Owing to great loss of blood and shortness of intervals the patient never feels really well.

In the treatment a wide cone is used, filtered through 3 mm. of aluminum so that the ovary and uterus receive equal radiation at each sitting.

The external genitals are protected by ray-proof material. At least seven sittings should be given during each interval. The treatment at first aggravates the condition but will succeed if persisted in. The third period should show great improvement. The objection that sterility will result is not justified.

Surg. *Med.*

ECLAMPSIA

The Path of the Eclamptic Toxin. J. F. D. Hunter. British Medical Journal.

The author states that he makes no attempt to prove what the eclamptic toxin is, but he wishes to suggest a means by which the toxin probably acts and this may help in the rational treatment of eclampsia. He got his ideas from a study of McCarrison's work on the thyroid.

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ECLAMPSIA

Eclamptic toxin is found in the cerebro-spinal fluid and Hunter says that it must act here as an irritant to produce convulsions in a manner opposite to that of a local anesthetic, injected into the spinal canal. He further argues that, if eclamptic toxin is found in the spinal fluid, it gets there through the choroid plexus which normally secretes the fluid. The choroid plexus is a true secretory gland and, in health, has a selective action in excluding from the spinal fluid toxic bodies circulating in the blood. The choroid plexus is controlled by harmones elaborated by the thyroid gland (or parathyroid) (McCarrison). Deranged thyroid means deranged choroid plexus from hermone starvation.

There are two types of toxins: those from endogenous metabolism and those from bacterial activity. McCarrison seems to show that bacterial toxins cause a disordered condition of the thyroid and that these toxins are elaborated in the alimentary canal.

Taking these facts, Hunter suggests that bacterial toxins cause a disordered condition of the thyroid and hence a disordered choroid plexus and (toxic) endogenous products of metabolism, which are much increased in pregnancy, find their way into the spinal canal and thus produce the conditions of eclampsia.

On these premises the treatment which suggests itself is as follows:

1. Remove the bacteria which form the toxin from the alimentary tract by lavage of the stomach and bowels and by purgation.

2. Remove toxins, bacterial and metabolic, from the blood. Venesection, saline purgatives, counter irritation of the kidneys and transfusion.

3. Remove toxins from the spinal canal by lumbar puncture.

4. Supply hormones to activate the choroid plexus by giving thyroid extract.

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ECLAMPSIA

5. Treat symptoms as they arise. Morphine for convulsions, etc.

He also suggests that a local anesthetic might be injected into the spinal canal with benefit.

[EDITORIAL COMMENT: This theory of Hunter's fits in with the idea that focal infections—tonsils, teeth, etc., are the underlying factors in determining the development of eclampsia. The bacterial toxins from focal infections do cause disordered conditions of the thyroid.

His theory would also explain why good results are obtained in eclamptic convulsions by lumbar puncture, as reported in a number of cases.]

Med.

ENURESIS

Influence of Helio-Marine Treatment on So-called Essential Incontinence of Urine. (L'influence de la cure hélio-marine sur l'incontinence d'urine dite essentielle.) Dr. L. Jaubert. Gazette d., hôp. civ. et mil., Paris, No. 55, 863-865.

The author noticed that many children who were treated at his heliotherapeutic institute for scrofula, anemia, rickets or bone tuberculosis were cured from incontinence of urine with which they were troubled. He then used heliotherapy combined with salt baths in pure cases of enuresis and obtained very gratifying results. The patients were exposed to the sun two or three hours daily. Every day they took also a warm salt bath. The author states that this treatment for enuresis can also be carried out successfully at home. However he mentions that only cases of so-called essential incontinence, i. e., cases in which the trouble is not caused by central or peripheral lesions, are amenable to this treatment.

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Med.

ENURESIS

Enuresis of Adults; Hypertonic Bladder. Dr. L. Brahdy. Ann. Surgery, Phila., No. 4, 482-488.

The author describes a form of enuresis in adults where the patient has frequent desire to urinate when the bladder contains only 150 c. c. or less of urine. Involuntary urination takes place if the patient does not void within a few minutes after onset of the desire. This condition occurs mostly in males. It is probably due to congenital hypertonicity of the bladder. There is lumbar pain, and tenderness of the lower lumbar and upper sacral vertebrae is almost constant. Cystoscopy shows usually a trabeculated bladder. No efficient treatment has so far been worked out. Belladonna is of little value. Distention of the bladder with 400-600 c. c. of boric acid solution has been successful in some cases.

Med.

EPIDEMICS

Closing Schools as a Means of Controlling Epidemics. U. S. Public Health Reports.

Closing schools as a means of controlling epidemics of measles, whooping cough, scarlet fever, diphtheria, smallpox, and poliomyelitis should be considered as a last resort, to be used only when thorough and systematic application of other measures fails to effect control. As a method it is clumsy, unscientific, and unsatisfactory, for it fails to control and results in the loss of school time and money. The modern method of careful daily inspection of infected schools, isolation of sick children, and quarantine of contacts, is both more effective and economical.

Such is the summary of report made by a committee of the Bureau of Education co-operating with a similar committee of the American Public Health Association. This committee consisted of

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THE MEDICAL INTERPRETER

EPIDEMICS

Dr. W. S. Small, Bureau of Education, chairman; Dr. W. C. Woodward, health officer, Boston; Dr. F. G. Curtis, health officer, Newton, Mass.; Dr. Bernard Kahn, acting director of medical inspection of public schools, Philadelphia; Dr. Taliaferro Clark, United States Public Health Service.

The inquiry of the committee developed that State laws show very few specific statutory references to the matter, rather general authority being vested in an administrative body. The review of literature showed that there has been a progressive abandonment of faith in, and practice of, closing schools as a means of controlling epidemics affecting school children. Such exceptions as were found in the literature related to the following special conditions: Inadequate medical supervision of schools; severity of epidemic that defies all efforts at control; and epidemics in which the etiology of the disease is unknown, such as infantile paralysis, epidemic meningitis, and possibly a few others.

The successful control of epidemic diseases among school children requires:

1. Keeping the schools open, with the possible exception of sparsely settled rural districts when medical inspection can not be obtained and where aggregation takes place only in the schools.
2. Careful daily or frequent periodical inspection of schools.
3. Careful provision for exclusion of cases and contacts, emphasis being placed on clinical data rather than upon fixed periods of exclusion.
4. Systematic home visitations; and
5. Reliance upon natural and physical cleansing rather than upon chemical disinfectants.

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Med.

EPILEPSY

Three Cases of Epilepsy Successfully Treated by Cervical Galvanization. (Trois cas d'épilepsie traité avec succès par la galvanisation cervicale.) Dr. P. Hartenberg. Revue gén. de clinique et de thérap., Paris, No. 27, 422-424.

Dr. Hartenberg has applied electrical treatment in epilepsy as far back as 1912. He has already reported a number of cases which were cured by his method of application. His method of treatment is as follows: Positive electrode is applied in the form of a collar around the neck. The negative electrode is applied to the abdomen. Every other day, for thirty minutes, a very strong current (50-60 M. A.) is passed, with the usual precautions against burns.

In the present article Dr. H. reports three cases, two of which showed very intense epileptic manifestations. The first, that of a lady of thirty years, was cured within three months. The second case was that of a man of twenty-seven years who had severe epileptic attacks. He was cured within six months. The third patient, a girl of fourteen, was cured in four months. All these patients were treated during the year 1912 and none of them have shown any epileptic manifestations since. The author adds, however, that he does not claim that this method of treatment will cure all cases of epilepsy. He also insists that hygienic, dietetic and medicinal treatment adapted to each case must accompany the application of electricity.

Med.

EPILEPSY

On the Complete Control of Epileptic Seizures by Luminal, Technique of Administration. Dr. F. X. Dercum. Therap. Gazette, Detroit, No. 9, 609-611.

Luminal is chemically closely related to barbital, one of the ethyl group of the latter being substituted by a phenyl group. It is

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EPILEPSY

therefore phenylethylmalonylurea. It came originally from Germany but is now made in America.

The author tried this remedy in epilepsy and obtained most gratifying results. The best form of administration is to give 1½ to 2 grains of luminal sodium at bedtime. Rarely as large a dose as 3 grains has to be used. In a number of cases the administration of luminal has resulted in the abolition of the convulsive attacks for periods extending not only over many months but even over several years.

The drug proved most remarkable in the group of essential epilepsy. In some cases it acted virtually as a specific. Not the least deleterious effects were ever observed. The smallness of the dose in epilepsy is noteworthy as the dose of luminal used as a hypnotic is 5 to 10 or more grains. It should be mentioned that in some cases luminal did not at once control the seizures, not infrequently it had to be given for a week or two before its full action was established. It was also observed that if small doses of bromide three times daily were given at the beginning of the administration of luminal, the latter acted more promptly. Dieting should also be observed. Red meats and carbohydrates should be reduced and all stimulants avoided.

Surg.

EPISIOTOMY IN LABOR

Median Episiotomy in Primiparous Labor. James A. Harrar, Amer. Jour. Obst., LXXX, 705.

Though the tissues of the levator ani muscles and more superficial urogenital septum are capable of remarkable stretching, if it occurs slowly, intermittently, and with sufficient surface lubrication, it is a fact that the more closely the lower birth canal is inspected

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after delivery the more constantly will injuries be found. About 44 per cent. of all primiparous and 10 per cent. of all multiparous patients at the New York Lying-In Hospital had lacerations of the lower birth canal that required repair. Some primiparae have no apparent laceration, but have a break in continuity of the deeper structures, fascia and muscles and their attachments. Others come through labor with vagina in-tact for all functional and mechanical purposes.

The author questions if neater end-results would not be obtained in all these primiparae if an episiotomy were done before the tissue had been stretched to its full capacity. Also the welfare of the baby makes it imperative that labor be not too long delayed. Cerebral hemorrhages, etc., may result with loss of the baby when incision of the perineum might have shortened labor an hour or more and have saved the baby. Such procedure will often obviate the necessity for low forceps.

It is difficult to determine when laceration is inevitable. Bulging of the perineum near the anus before the vagina begins to gape nearly always means laceration, as does also the shiny, glistening appearance of the stretching skin.

An incision of the perineum may prevent a ragged, irregular laceration and leave clean-cut edges to approximate. The author advocates a median incision rather than a lateral one, and says that this should be made the central points of insertion of the superficial group of muscles constituting the urogenital septum. The lower end of the incision is curved away from the anus to avoid the sphincter. This incision is employed only during the perineal stage of labor and is made with scissors guided by the finger in the vagina. Successive snips are preferable to one bold cut.

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Med.

EYE DISEASES

Iodine Solutions in Ocular Therapeutics. (Les solutions iodées en thérapeutique oculaire.) Dr. F. Terrien. Arch. d'ophtalmol. Paris, No. 10, 627.

Pure tincture of iodine cannot be used in eye work because it is too irritating. The French oculists use iodine with chloroform in a solution of 1 to 30. The advantage of the iodine-chloroform solution lies in its volatility, the rapid evaporation preventing injuries to the eye. This solution was used with favorable results in grave ulcers of the cornea, in trachoma, wounds of the eyelids, stye, suppurating blepharitis, phthiriasis of the lids, and in infections of all kinds.

For disinfection in surgical operations on the eye this solution cannot be used, as it is not well borne. In such cases the following preparation is used:

Tinct. iodine, glycerine, alcohol (90 per cent.) equal parts.

This preparation is used by Dr. Lapersonne and has never produced any untoward effects.

Med.

EYE DISEASES

Therapeutic Value of Injections of Sterilized Cow's Milk in Some Ocular Affections. (Valor terapeutico de las inyeccines de leche esterilizada de vaca en algunas afecciones oculares.) Dr. B. Carreras Duram. Medicina ibera, Madrid, No. 81, 143-145.

The use of milk injections in affections of the eye was recently introduced by Mueller and Tanner in Vienna. They successfully treated severe cases of iritis, heredo-syphilitic parenchymatous keratitis and even gonorrheal conjunctivitis and other eye diseases by this method. The dose was 5 c. c. of fresh sterilized milk. Three injections in the buttocks were made per week, but more than three in-

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EYE DISEASES

jections were rarely necessary. In choroiditis the treatment was of no value.

In this article Dr. Carreras reports six cases of eye diseases in which he used milk injections. He completely cured four cases of keratitis and one of iridocyclitis and a case of trachoma was greatly improved. He observed in all cases a speedy disappearance of severe subjective symptoms. In most cases pain and photophobia disappeared twenty-four hours after the first injection. Dr. C. also lays stress on the speedy reduction of the corneal infiltration and of the turbidity of the vitreous and aqueous humors.

Med.

FILARIASIS

Filariasis in Southern United States. By Edward Francis, Surgeon U. S. Public Health Service. Hygienic Laboratory.

For the past thirty years filariasis has been known to be endemic at Charleston, S. C., and inasmuch as Charleston's climatic conditions and the species of mosquitoes found there are duplicated in the coast cities of the South, the inference has become general that filariasis is a widespread infection of our southern cities.

The United States Public Health Service, in taking cognizance of the extreme prevalence of filarial infection at Charleston, has conducted a series of investigations having the following objects in view:

(a) A filarial survey of a number of southern cities for the purpose of determining, by blood examination, the extent and degree of prevalence of the infection in their population.

(b) The determination of the species of mosquito which was acting as the mosquito host and carrier of the infection at Charleston.

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FILARIASIS

(c) A determination of the best means of eradicating or preventing the spread of the infection.

Filariasis Defined

Filariasis of man is a condition characterized by the presence in the blood of microscopic, slender, snakelike, motile microfilariae (round worms) which have a length about thirty times the diameter of a red blood corpuscle and a width about equal to the diameter of a red blood cell; they have a rounded head and a tapering tail; they are the offspring of adult female parent worms permanently located in some tissue of the body and discharging their young into the circulation. The parent worms in the case of Filaria bancrofti are located in the lymphatics and lymph glands of man; the parent worms of Filarialoa, Filaria perstans, and Filaria demarquai are located in the connective tissue of man. Filaria bancrofti is by far the most widespread of the human filariae and is the species of which this bulletin treats, and for that reason a short general description of that species will now be given, together with some of the symptoms which it causes. Filaria bancrofti is found in practically all tropical countries and one endemic focus has been located in the United States—at Charleston, S. C. As the blood of man is the normal habitat of this microfilaria it was at first called Filaria sanguinis hominis.

A most interesting phenomenon connected with this microfilaria is its night activity, and for that reason it has also been called Filaria nocturna; the blood of a filarial patient examined during the hours around midnight may show microfilariae in great numbers, whereas the blood from the same patient examined in the hours around the midday may show only one or two parasites. An estimated number of forty to fifty millions of microfilariae circulating in the blood may give rise to no symptoms since their size permits them to

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traverse the capillaries unobstructed. "The healthy, fully formed microfilariae have, so far as we can tell, no pathogenic properties whatever; the parent worm and the immature products of conception alone are dangerous." (Manson.)

The adult worms may obstruct the thoracic duct or occlude the smaller lymphatic vessels or the lymph glands, resulting in a damming back of the lymph, giving rise to lymph oedema of the undrained area, and due to this increased lymph pressure there results a condition of lymphatic varix or a varicose dilated state of the lymphatic vessels which causes enlargement of the part affected; hence "lymph scrotum," "varicose groin glands" and "varicose axillary glands." If the dilated lymphatic vessels located in the tissues surrounding the kidneys, bladder, testicle or peritoneum become overdistended and rupture, there results a chyluria, chylocele or chylous ascites.

Elephantiasis, although common where Filaria bancrofti abounds, is not usually accompanied by microfilariae in the blood; there are, however, reasons for believing that elephantiasis is a filaria disease in which the female parent worm located in a lymphatic vessel or lymph gland of the affected part has aborted her immature ova, which, on account of having a larger diameter than that of the healthy, fully formed microfilariae cause embolism of the lymphatic glands, resulting in great enlargement or elephantiasis of the leg, arm, breast, scrotum or vulva.

Filariasis is a mosquito-borne disease and several species of mosquito have been found capable of conveying the infection. Some of the known efficient hosts of Filaria bancrofti are Culex fatigans, Stegomyia pseudoscuttelaris, and Anopheles maculipennis.

The Life Cycle of Filaria Bancrofti

The adult filariae are males and females and are found only in the lymphatic system of man. The approximate length of the males

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is one and one-half inches and that of the females is three and one-half inches. The number of adult filariae found in a single individual is small; eight worms would be a large number for one person. Conjugation of the sexes is essential to multiplication and takes place only within the lymphatic system. Multiplication is brought about by the expulsion of embryos by a gravid female. The number of embryos which one female may discharge is very large—probably at least 1,000. The embryos escape from the lymphatic system and circulate in the patient's blood as microfilariae.

The microfilariae do not multiply in the blood; any increase in the number of microfilariae in the blood comes from additional ones thrown into the blood stream from a parent worm located in a lymph gland. The microfilariae live for a long time in the blood; probably for years. They circulate awaiting the opportunity of being imbibed by a biting mosquito. The mosquito in drawing blood into its stomach draws in also the microfilariae which after losing their sheaths in the mosquito's stomach, pierce the stomach wall and pass to the thoracic muscles where they undergo metamorphosis. After a variable time of approximately two weeks spent in the thoracic muscles, the larvae migrate to the proboscis and there await an opportunity to get back into man, which opportunity presents itself when the mosquito again bites an individual.

During their stay in the mosquito no multiplication of larvae takes place. The larvae when they are ready to leave the proboscis measure one-twenty-fifth to one-sixteenth inch in length.

The larvae on being delivered back to man by the bite of an infected mosquito pass by way of the lymphatics to the nearest lymph gland where they grow to be adult filariae.

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THE MEDICAL INTERPRETER

FILARIASIS

The cycle, as outlined, starts with the parent worm located in a lymphatic gland giving off her microscopic embryos and ends with those embryos developed into three-inch worms and again located in a lymphatic gland.

Med.

FILARIASIS

Method of Examining Blood for Microfilariae. Hygienic Laboratory.

In the method of examination employed, blood was collected between 10:30 p. m. and 1:30 a. m. by sticking, with a Hagedorn needle, the tip of the finger, from which 6 to 8 large drops (one-fourth to one-third c. c.) of blood were squeezed out and allowed to fall on an ordinary clean glass slide. With a fresh toothpick the blood is evenly spread, before clotting, over the entire surface of the slide excepting a small area at one end reserved for a number scratched in with a diamond writing pencil. The thick blood films are dried in the air in a level position, protected from roaches and flies but freely exposed to the air. As soon as dry, the slides are stood upright, back to back, in Coplin jars containing preferably distilled water, or containing good tap water. The film should be dehemoglobinized as soon as dry in order to get a colorless film. An hour usually suffices for the water to entirely remove the hemoglobin from the red corpuscles, leaving the film colorless, but otherwise unaltered. If desirable, the slides can be transferred to fresh water to complete the laking. As soon as laking of the hemoglobin is complete, the slides are examined while still wet on a mechanical stage under a 16-millimeter objective; in such preparations the glistening microfilariae are readily distinguished. In routine work, where a determination of the number of individuals in-

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FILARIASIS

fected is the sole object of the investigation, examination of the wet laked films is entirely satisfactory and was followed in our surveys.

It became necessary in some instances for the films to remain wet forty-eight hours while awaiting their turn for examination. In such cases, bacterial growth is likely to disintegrate the film and cause its detachment from the slide; a few drops of formalin added to the water will prevent such results.

Staining of Microfilariae

Thick smears decolorized in distilled water as described above are sufficiently fixed to the slide by drying in the air.

Stain with Delafield's hemotoxylin for five minutes, steaming the stain over a flame as in staining tubercle bacilli. Wash thoroughly in tap water. Examination with the two-thirds objective shows that the preparation is overstained. Therefore, decolorize with acid alcohol sufficiently to differentiate with the low power the cells of the cell column of the parasite. Dehydrate in absolute alcohol, clear in oil of cloves or xylol, mount in Canada balsam. Staining of the parasites becomes necessary when it is desired to study their structure.

The polychrome stains commonly employed in blood examinations may also be used.

Med.

FISTULA

Cure of a Longstanding Anal Fistula by Suction Treatment. (Heilung einer langwierigen Mastdaemfistel durch Saugbehandlung.) Dr. E. Suntheim. Berlin klin. Wochenschr., No. 22, 521.

The patient suffered from an anal fistula which developed from a rectal ulcer and neglected hemorrhoids. As he was in a very weak-

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FISTULA

ened condition (peri-myocarditis, pleurisy, nephritis) an operation was out of the question. It was decided to try Bier's hyperaemic treatment. A suction glass was applied for a few minutes each day. Towards the end the time was extended to eight minutes. By the simultaneous use of adjuvant treatment with cocaine ointment, bismuth, vaseline and sterile irrigations the fistula was cured within two weeks.

Surg.

FISTULA

Fistula in Ano-Rectal Region, Conservative Surgery in the Treatment of. J. D. Albright.

In these days of conservation, when we are advised to be economical and save in every possible way, it may be apropos to say a word or two in favor of conservation of human tissue when conditions are presented which are usually looked upon as demanding surgical treatment. In following out the principles of conservative surgery in the ano-rectal region, the predominating purposes are to save the tissues instead of destroying them; to encourage and permit healing of the affected parts instead of removing them; to enable the patient to continue his daily routine of labor, business or pleasure, with a minimum of inconvenience, and to save him and his family from the dread, anxiety and danger incident to hospital operations.

Conservative rectal surgery has scored a distinct triumph in the treatment of all ano-rectal diseases, except those of a malignant nature. Hemorrhoids, fistula, fissure, external tabs and benign growths of several varieties; proctitis and its primary symptom—pruritus ani, or other conditions which cause ulceration, bleeding, pain, etc., can be effectively treated and definitely cured by a system of treatment variously known as ambulant, non-operative or conservative, all the

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work being done in the office without inconvenience to the patient and at no greater loss of time than that required for the visit to the office; in fact, the patient quickly learns to look upon the treatment as a mere accident.

Hospital statistics prove that the old-time surgical operation for fistula fails to effect a cure in about fifty-five per cent. of cases. This is due to the existence of unknown pockets and branches which communicate with the main channel or fistulous tract. These adjacent spaces are always difficult to locate and explore in their entirety, and in many cases a thoroughly comprehensive diagnosis is absolutely impossible. This explains the large percentage of unsatisfactory results, as it is evident that if these tributaries cannot be found during the examination, they cannot be located by the operator working in a bloody field, and as they are overlooked during the operation, they remain just as before; and even though the main tract may heal, this will not take place at the point of its junction to the branch, the result being a continuation of the former trouble, and the recommendation of a second operation.

Here, more than in any other disease of this region, the conservative method of treatment deserves first place, because the results will be found satisfactory in all cases to which it is applicable. It can be employed in fully ninety-five per cent. of all non-operated fistulas, and after unsuccessful operations, excepting only those extreme cases of which one sees comparatively few, the percentage of cures is only slightly less.

The accompanying illustration demonstrates the range of applicability of the conservative method in the treatment of fistula, the result obtained being in every respect perfect and satisfactory. The history follows:

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Conservative Operation for Dividing the External Sphincter Muscle.

In this illustration a complete rectal fistula, the sinus running entirely external to the sphincter, the external opening is shown at *A*, the grooved director being passed into it and out through the internal opening, the point being carried downward and out through the anal orifice.

If a bistoury were now passed along the groove, the fibres of the external sphincter would be divided obliquely, and as this must be avoided, some variation of technique must be made. The method usually advised in such cases is to insert the director, the groove being directed posteriorly, pass a bistoury along the groove to the internal opening and divide the tissues under the triangle marked by *A B* and *E;* then divide the muscle from *D* to *E*.

An improved technique, which will bring about the same result with less destruction or tissue, is as follows:

First, divide the tissues on the director from *A* to *C*, this point marking the border of the sphincter; next, turn the groove posteriorly and pass a straight, blunt-pointed bistoury to the internal opening and cut under the muscle to *D;* lastly, turn the director again and divide the muscle and skin from *D* to *E*. This operation can be done in four sections without confining the patient.

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FISTULA

Mr. J. L., aged forty-two years, had an abscess in the ano-rectal region nine years ago. An incision was made by his family physician, followed by irrigation, but the wound refused to heal, and a fistula developed. After one year he called at a hospital and was advised that an operation would be necessary. The patient refused operation and allowed the condition to remain without treatment for eight years. The opening present from the beginning was located near the anus, but about the third year a second opening developed, and a year later, a third, on the left buttock, anteriorly and posteriorly about one inch from the anus.

Mr. L. consulted me on April 21, 1919. I found an opening on the left anal margin, with a tract extending upward to the rectum, a distance of two inches from the external opening. No internal opening existed. This tract involved the lower portion of the external sphincter muscle, but the upper half was submucous. About an inch toward the left a lateral tract was found, which extended from the anterior to the posterior opening already referred to, being complete. A subcutaneous tract extended from the first opening to the middle of the lateral tract, forming an inverted "T," the patient lying on his left side.

I first divided the lateral tract and then followed the one extending into the rectum, dividing about one-half inch once a week. Healing took place promptly except at the point of junction of the two tracts, and I then discovered a tract nine inches long running backward and upward, as shown by the scar in the illustration. This was gradually divided in the same manner, and a complete cure was the result.

All work was done under local anesthesia, produced by one per cent. apothesine. A total of twenty-five cuts was made. The only dressing was swabbing with iodine and glycerine, 1 to 7, and

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packing with gauze. Bleeding was never of any consequence, being controlled by the packing, which when necessary was saturated with about two per cent. solution of subsulphate of iron. Patient was discharged October 11, 1919.

He worked in a shipyard every day during treatment and had very little discomfort at any time. He gained about fifteen pounds during the treatment, and when discharged said he felt in better physical condition than for many years before. Since his discharge, there have been no signs of anything that would indicate the presence of any trace of his former trouble.

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Surg.

THE USE OF AUTOGENOUS BONE GRAFTS IN THE TREATMENT OF CERTAIN SIMPLE FRACTURES OF BONE

Basil Hughes, D. S. O., M. A., M. B., B. C. Camb., B. Sc., Lond., F. R. C. S. Eng. London Lancet.

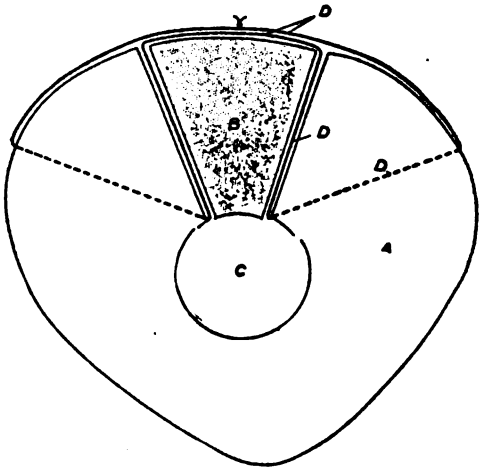

Diagram of cross-section of bone, showing how the wedge-shaped graft is made secure. A, Shaft of bone. B, Graft. C, Medullary canal. D, Kangaroo tendon.

There are today very few fractures of bone in which a satisfactory length and alignment cannot be obtained without resorting to open operation. The enormous preponderance of cases of bone fracture amongst the sum-total of wounds inflicted upon humanity during the past war has afforded great scope for originality in the introduction of newer methods of treatment and improved apparatus, which have sufficed to effect and maintain a satisfactory length and alignment not only in the case of simple fracture, but also in the most extensive type of compound and comminuted fracture. The popular war-splint, which was either Thomas' original knee-splint or some modification thereof, largely supplanted the pre-war wooden splints and plaster, and in so doing removed many objections to the

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latter apparatus in that the difficulty in maintaining length and alignment, the risk of compression and constriction and consequent delayed union occasioned thereby, ischemic paralysis, and the like, were overcome.

There are still, however, a few simple fractures difficult to treat satisfactorily without open operation. These include fractures situated in the immediate neighborhood of the hip and shoulder joints, which are often followed by osteo-arthritic changes unless a very accurate reduction is obtained, and spiral fracture of the lower third of the tibia where imperfect length and alignment will lead to faulty transmission of body-weight accompanied by its attendant evils. It must be remembered that every change in the formation and function of a bone is attended by certain and definite changes in its internal architecture (Wolff's law), hence a true length and alignment are of paramount importance.

Bone Grafts; Their Fate, and Advantages Over Plates and Screws

In order that a bone graft may grow and function certain conditions are essential:

(1) The graft must be autogenous. Bone transplanted from the lower animals to man or from one individual to another lives and functions only very exceptionally.

(2) The graft must be suitably nourished. A piece of bone transplanted from one part of the body to another will continue to live if strict asepsis has been observed; there is abundant evidence to prove that it can acquire the requisite nutrition from the lymph of the part in which it is lodged until such a time as its own blood supply becomes established.

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(3) When removing the graft it is advisable to include both periosteum and endosteum, for by such means earlier vascularization and consequent union of the graft are undoubtedly obtained.

(4) When once the graft has commenced to unite a certain amount of movement of the muscles can with advantage be allowed. By this means the correct lines of stress and strain will become established in the graft according to Wolff's law.

There are several theories to explain what actually happens to the bone graft. The important question seems to be, is the graft osteogenetic or is it not? Some hold that all the bone in the graft is absorbed, and that the new bone is formed entirely from the periosteum. This view would gain support from the work of Stiles in his sub-periosteal reaction of bone for tubercular disease, and from the work of Leriche on esquillectomy for war fractures. Macewan's view that the new bone is formed by proliferation of osteoblasts within the bone itself, and is independent of the periosteum, directly contradicts the above. It seems that a solution to the controversy rests in a real understanding of what is meant by the true periosteum. If the periosteum includes the true cambium of bone—that is, the layer including Sharpey's fibres—then without a doubt such a structure is osteogenetic. Another view is that the graft is not in any way osteogenetic, but simply acts as a scaffolding, which in due course is absorbed and replaced by new bone by immigration into it first of osteoclasts and later of osteoblasts from the adjacent bone. My own experience leads me to believe that all these views are in part correct, if the periosteum be taken to include the true cambium of the bone, and in cutting the necessary grafts I have included periosteum, compact bone, and endosteum.

Early and repeated skiagrams of the grafts have shown partial rarefaction only about the periphery of the graft and not a complete

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rarefaction, whereas new bone formation can be seen to be taking place from the graft itself.

Although many brilliant results have been obtained through the fixation of fractures by means of plates and screws, it cannot be denied that the procedure involves the introduction into the tissues of a lasting foreign body, which cannot be removed by osteoclasts and replaced by new bone. Sooner or later rarefaction of the bone takes place around the screws and the plate works loose. Pain of a boring character may occur in the bone, and, worse still, a low form of suppuration may take place even as late as four years after the introduction of the plate. This is specially prone to occur if the patient's resistance be lowered by any debilitating disease, such as malaria. I removed a piece of silver wire from a patient's patella owing to suppuration occurring two and a half years after its introduction; also a plate and screw from the femur of another patient four years after its introduction, for a similar reason. I have met with other cases in which removal of the foreign body has been necessary owing either to pain, suppuration, or the plate working loose. An examination of the pus in three cases showed *Staphylococcus aureus* to be present, but in two other cases no organisms could be found either in a stained film or by culture. Further, in my experience, union of the fracture has never been so rapid or natural in the cases in which plates were used as in those in which the bone graft has been employed. Moreover, in not a few cases the introduction of a plate has been followed by non-union of the fractured bone.

On the other hand, in using a bone graft we are not dealing with a foreign body, but with living tissue which in time becomes part of the bone and in which the lines of stress and strain eventually conform according to Wolff's law. The operation for bone grafting is certainly more extensive and involves opening up the medullary cav-

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ity, but the latter is of no moment if strict asepsis be observed. The operation for bone grafting takes a longer time than fixation by plates and screws; the technique is more exact and difficult and requires considerable practice. The type of graft called for in the case of simple fracture is almost invariably the "sliding graft."

Operation

The very strictest asepsis is called for in this branch of surgery, for if once infection gains access there is not only the risk of osteomyelitis with its sequelae becoming established, but death of the graft will certainly follow. It is advisable to give two or three inoculations of staphylococcus aureus vaccine prior to the operation. It is today very advisable to ascertain whether or not the patient has had malaria, because malaria exerts a very baneful influence upon the bone marrow. If any malaria is present it should be treated without delay. Operations upon bone are not so satisfactory in malarial countries as they are at home, and simple fractures do not unite so readily in malarial subjects. Similarly, if the patient has any time suffered from syphilis it should be ascertained that he is cured, as operations upon the bones of syphilitics at any period of the disease are apt to be disappointing. All skin infections, such as acne, boils, etc., should be corrected before operation, and a careful examination of the urine undertaken in order to exclude albuminuria and glycosuria.

After having thoroughly cleansed the skin of the part the limb is emptied of blood and a tourniquet applied. In case of fracture about the shoulder and hip joints digital pressure, if possible, should be employed. An incision is now made down to the bone and the site of the fracture thoroughly exposed. The edges and sides of the wound are carefully protected with tetracloths and the bone ends are

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seized with forceps. While the necessary extension is made by an assistant the ends are accurately approximated and held in position with Lane's forceps by another assistant. The graft should be wedge-shaped and made to include periosteum, compact bone, and endosteum. It is then made to bridge the fracture, and is secured in its place by means of kangaroo tendon in the manner shown in the figure. Throughout the operation it is desirable to keep even the gloved finger out of the wound. Only boiled instruments should enter the wound, and all swabbing should be done by means of dry sterile swabs on the end of forceps. When the graft is satisfactorily fixed the soft parts should be allowed to cover it and the skin approximated with a continuous suture or Michel's clips. The limb is then put at rest on a splint, and the stitches can be removed on the tenth day.

At the end of the third week the patient may begin to use his toes or his fingers, and by these means the bone graft to some small and sufficient extent begins to function, and thereby the correct lines of stress and strain crystallize out according to Wolff's law.

Remarks

The graft has usually grown in firmly by the end of the sixth week, and at the end of the eighth week the patient may begin to use the limb. Skiagrams taken after the tenth week show the graft to be almost indistinguishable both in texture and quality from the adjacent bone.

Of a particular series, including fifteen cases, two were fractures of the surgical neck of the humerus and one a fracture in the upper third of the femur. One was a fracture of the neck of the femur; this case was treated by driving a bone peg, fashioned from the tibia, through the great trochanter into the head of the bone via the neck. One case was a fracture in the upper third of the shaft of

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FRACTURES

the humerus, while the remainder were spiral fractures of the tibia in its lower third. One case suppurated despite the strictest aseptic precautions, but unfortunately this patient contracted severe malaria after the operation. Nevertheless, in this case the graft grew in and the patient did well under intensive treatment with quinine.

Grafts will grow and function in cases of mildly septic fracture, but I hope to deal with their uses in this connection in a subsequent paper. I think that from every point of view the autogenous graft is superior to the plate and screws or to the use of any other kind of foreign body. The results have been so gratifying and excellent that I shall always employ it in future for those cases that call for open operation. In all of the above cases Albee's bone-grafting instruments were used.

Med.

GOITER

Long Standing Case of Exophthalmic Goiter Cured by Inunctions. Dr. H. Bazett, Practitioner. London. No. 5, 389-391.

A married woman of thirty-eight who had developed bilateral exophthalmic goiter at eighteen, and had been operated on one side (right) only at thirty-two on account of extreme shortness of breath, was greatly suffering from palpitation of the heart and other nervous troubles. The left sided goiter, of about the size of a tangerine orange, was of extraordinary hardness. The treatment consisted in constant application of an ointment composed of one part of Ung. iodi to two parts of Ung. hydrarg. co. with an equal amount of Ung. plumbi subacetatis.

Glyc. belladonnae .....1 part
Ung. iodi .....2 parts
Ung. hydrarg. co.....4 parts
Ung. plumbi subacet.....6 parts

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GOITER

Internally 15 m. of Donovan's solution were taken daily. Six days later the patient returned and complained of having felt very ill since using the remedies. But the goiter was much softer and less in size. The internal treatment was then discontinued. Ten days later the patient came back and was feeling much better. The tachycardia had greatly diminished and the glandular swelling was quite soft and much smaller. About two weeks later all distressing symptoms had disappeared and the goiter was practically gone. When the patient was seen a year later she was perfectly well and the goitre was no longer noticeable.

Med.

GOITER

Medical Treatment of Goiter. (Traitement médical du goitre.) Dr. A. Kotzareff. Rev. gén. de clin. et de thérap. Paris. No. 42, 665.

The surgical treatment of goiter has made great progress but in certain cases the medical treatment is still advisable. Dr. Bircher of Aarau, Switzerland, has introduced a method of treatment which promises to be of great value. Through extended experimentation he has succeeded in compounding a remedy in tablet form. The tablets contain lipoidine, quinine, calcium and silicon. The exact quantities are not divulged. Dr. Bircher distributes the remedy on application. The treatment lasts usually four to five weeks (four tablets daily). Dr. B. has had marked success in seventy per cent. of the cases; in ten per cent. there was improvement, in twenty per cent. the treatment failed. Dr. B. has operated on more than 160 cases of goiter but he always tries first the medical treatment and only when this fails he proceeds to an operation.

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Med.

GONORRHEA

Avoidance of Relapse in Gonorrhea. Dr. S. Russ. Brit. Med. Journ. London, 270.

In the treatment of gonorrhea by irrigations or injections relapses are common. If the liquid could enter the numerous mucous crypts and recesses of the urethra the disease would be overcome by one or two irrigations. But as it is there is no compensation in the method for the dilution and loss of valuable antibodies to gonococci which nature provides and distributes by the blood and lymph in the infected area.

Dr. R. considers electrolysis the most efficient treatment for preventing relapse. The only lavage he ever used was the patient's own urinary voidance which visibly washes out all mucopus and gonococci that are removable. He inserts a perforated catheter and applies a suitably directed current which sets up mucous tides within the gland spaces in which gonococci and leucocytes migrate towards the catheter and seek the anode. The harvest of gonococci and pus plugs on withdrawing the electric catheter is remarkable and micturition brings still more. This treatment does not wash away the antibodies and no chemical irritation is set up. This method requires at least three and a half weeks of treatment but relapses are extremely rare.

Med.

GONORRHEA

A New Germicide for Use in the Genito-Urinary Tract: "Mercurochrome-220." (Young, White and Swartz. Jour. of the A. M. A.)

During the past two years the research work in the laboratories of the James Buchanan Brady Urological Institute has been given over largely to the study of antiseptics with a view particularly to the

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development of drugs applicable to the genito-urinary tract. As a result of experiments and clinical use in this clinic, Davis and Harrell recommended the use of acriflavine in the treatment of acute gonorrhea, and this form of therapy was then used with good results in certain venereal clinics of the American Expeditionary Forces.

Impressed with the possibilities of using dyes as a basis for the development of therapeutic compounds, we have concentrated our efforts on the production of new drugs possessing the penetrating qualities of dyes while at the same time being germicidal and relatively non-toxic and non-irritating. The number of compounds that have been and are being produced in the pursuit of this research is considerable. From among them the substance reported on in this paper has been selected for extended study. In mercurochrome-220 we have a drug of demonstrated germicidal value. The speed with which some old infections of the bladder and kidney pelvis have disappeared after its use is striking, and the absence of irritating and toxic qualities, together with the ability of the patient to retain a one per cent. solution for hours without discomfort, are sufficiently probed to establish the possibilities of the drug in these conditions. For the first time we have a drug of great germicidal strength that can be tolerated in the human bladder for several hours, which establishes an ideal condition from the standpoint of its sterilizing effects.

Its value in colon and staphylococcus infections has led us to apply mercurochrome-220 to gonorrhea and chancroidal ulcerations, our investigations having been carried on under the grant recently made us by the Interdepartmental Social Hygiene Board for research in the prevention and treatment of venereal diseases. Our series of cases so far is limited, but the demonstration of the sterilizing value of the drug in the urethra, bladder and kidney pelvis is promising enough to warrant this early publication.

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THE MEDICAL INTERPRETER

GONORRHEA

Considerations Governing Synthesis of a New Urinary Germicide

In synthesizing a drug for local use as a urinary antiseptic, it was sought to combine the following properties: (1), ready penetration of the tissues in which the infection exists; (2), lack of irritation of the drug to tissues; (3), high germicidal activity; (4), ready solubility in water and stability of the solution; (5), freedom from precipitation in urine; and (6), sufficiently low toxicity to avoid systemic effects from the small amount of the drug that may be absorbed.

In order to meet the first requirement it was decided to make use of a penetrating dye, not necessarily a germicide of itself, but serving merely as a carrier in which a germicidal chemical group could be substituted. The clinical experience that the basic dyes, such as fuchsin, brilliant green, crystal violet, and, in some cases, the flavines, are too irritating to the mucosa of the urinary tract for general use suggested the use of acid dyes. This class of colors, which includes as its commoner representatives the phthaleins and most of the azo dyes, offers a wide range of choice. From purely chemical considerations it might be predicted that the basic dyes would be more irritating than the acid dyes. The former are salts of weak bases, and therefore their solution must have an acid reaction. The acid dyes, on the other hand, are used as sodium salts, and solutions of them necessarily have a neutral or slightly alkaline reaction, depending on whether the free dye is strong acid, such as a sulphonic acid, or a weak acid, such as a phthalein. Since the tissues are generally more sensitive to acidity than to alkalinity, this reasoning led to the choice of an acid dye as the basis of the synthetic germicide.

The irritating effect of solutions of mercuric chlorid is due to the mercury ion. If, however, the metal is substituted in an organic

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compound, such as an acid dye, the mercury no longer yields ions, but exists as a firmly bound part of the dye molecule itself. In this form of combination the properties of the metal as manifested by mercury salts are more or less completely masked. The new substance gives a negative reaction with the usual reagents for mercury, such as alkalis, iodids and alkali sulphids. The organic combinations of mercury also generally exhibit lower toxicity than do corresponding amounts of mercury in salt form, and frequently, but not always, their germicidal action is milder than that shown by salts. With the great variety of possible combinations offered, depending on the nature of the organic substances used, it is not very difficult to find products whose advantages of nonirritability, lower toxicity and high penetrating power more than offset their somewhat decreased germicidal power as compared with that of the mercury salts.

Description of Mercurochrome-220

To the substance obtained by substituting one atom of mercury in the molecule of dibromfluorescein we have given the name "mercurochrome-220." Chemically it is dibrom-oxymercury, or its sodium salt.

The free acid is a red powder insoluble in water but readily soluble in sodium hydroxid solution, with the formation of a deep cherry red color, showing fluorescence on dilution. The dry salt forms iridescent green scales, slightly hydroscopic and readily soluble in water. The solution is stable and is not affected by moderate heat or exposure to the air. Strongly acid urine (p_h=5.0) gives a slight precipitate *of the free dye;* but if the acidity is p_h=6.4 or less, no precipitation occurs. There is entire freedom from precipitation when a one per cent. solution of the drug is mixed with an equal volume of medium rich in protein, such as hydrocele fluid. The solution stains

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the skin a bright red color, but the stain is readily removed by rubbing first with two per cent. potassium permanganate solution, and then with two per cent. oxalic acid solution.

Penetration

Attention must be paid to the penetrating power of any germicide for use in the urinary tract. Fenger has shown that "in thirty-eight hours after inoculation the gonococci have only just begun to effect entrance between the epithelial cells. The inflammation extends until the gonococci have penetrated deep into the layers of the mucous membrane, which has become acutely congested, the epithelium undergoing mucous degeneration, and exfoliating in patches." MacCallum states that "the gonococcus penetrates among the epithelial cells and extends even into the subepithelial tissues of the urethra." Sections made from cases of papillary cystitis and from pyelitis show the organisms to have penetrated to the deeper layers of the epithelial cells.

Toxicity

In determining the toxicity of the drug, various solutions were administered intravenously. The urine was examined and the phenolsulphonephthalein excretion was determined, and in dog's blood urea was determined before injection. We noticed a variation in the amount of the drug that rabbits and dogs could tolerate. Ten mg. per kilogram invariably killed rabbits in twenty-four hours, and no gross lesions were found at necropsy. Rabbits receiving 5 mg. per kilogram showed a decrease in phenolsulphonephthalein output and an albuminuria that lasted about a week. Dogs tolerated 10 mg. per kilogram very well with no evidence of discomfort or illness. In each instance there was produced an albuminuria without casts and a tem-

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porary reduction in phenolsulphonephthalein output but no rise in blood urea. The albuminuria persisted about five days. At no time were casts found. The phenolsulphonephthalein output returned to normal with the disappearance of the albuminuria. No evidence of the kidney damage was found at necropsy on animals killed at the end of the experiments. With this toxic limit established no harm is to be expected from the small amount of the drug that may be absorbed when used locally in the genito-urinary tract.

Irritation

One per cent. solution of mercurochrome-220 gave no evidence of irritating qualities when used in the conjunctival sac of rabbits. Solutions of this drug in strength from 0.1 to 5 per cent. have been used in the human genito-urinary tract as a local antiseptic. In the kidney pelvis a one per cent. solution was used. This was slowly injected through the ureteral catheter, the catheter was plugged, and the solution was retained for five minutes. There has been no sign of irritation or reaction following its use. This procedure has been carried out three times in one week in some instances. In the urethra a five per cent. solution caused only temporary burning when retained five minutes, and a number of cases of acute urethritis have been treated by the use of one per cent. solution injected four times a day, the solution being retained five minutes at each injection. There has been no irritation beyond occasional temporary smarting. No cases of retention have been seen, and no stricture formation has resulted from its use in our series of cases, as will be seen from the case reports.

With the exception of the cases noted, we have seen no irritation beyond occasional temporary smarting at the time of injection. The solution has been used in a number of bladder infections with

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small amounts of residual urine without irritation. The fact that irritation has been seen so rarely indicates that its occurrence in these cases is due to some individual hypersensitiveness rather than to any inherent property of the drug. Some observers who have been using it have reported not only absence of irritation but also a prompt cessation of pain following the use of the drug in infected bladders and kidney pelves.

Comments on Bacteriologic Tests

Acriflavine is shown to be much less potent as a germicide in even the most concentrated solutions, if allowed to act on the organisms for one hour or less. It surpasses mercurochrome-220 in the twenty-four hour test, at this period appearing to be about four times as effective as the mercury compound. It is hardly logical to judge a local urinary germicide by its action on organisms during such a long period of time; a short period of exposure in the test, on the other hand, approximates clinical conditions. If *rapid* disinfection is a desideratum, as it appears to be, mercurochrome-220 is superior to acriflavine.

Comparison of mercurochrome-220 with the silver protein compounds is open to two interpretations. If we consider the action in the test tube of those solutions used clinically—ten per cent. argyrol and one per cent. protargol—the silver compounds compare favorably with the mercury dye except in the action of protargol on *Staphylococcus aureus*. If, on the other hand, we consider the action of solutions of the same concentration of these three substances, we find that the silver compounds are in no wise comparable with mercurochrome-220. Since most of the urinary infections penetrate more or less deeply into the mucosa, therapeutic results will probably be controlled by the concentration of the germicide that finds its way into

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the tissues. It therefore appears that our comparison should take into account *the effective concentration* of the various drugs, rather than the concentrations applied to the surface of the infected area. The later concentrations may not, and in the case of a nonpenetrating substance, like argyrol or protargol, probably do not, represent the relative concentrations of the germicide actually reaching the seat of the infection. For this reason a comparison of *absolute* concentration seems a reasonable one, in view of the superior penetrating power of mercurochrome-220, and such a comparison shows a superiority of the mercury dye over the silver proteins. Thus, whereas both argyrol and protargol at 1:1,000 fail to kill either *B. coli* or *Staphylococcus aureus* in one hour, the same concentration of the mercury dye kills both organisms in about one minute.

Methods Employed in the Clinical Use of Mercurochrome-220

In the treatment of infections of the kidney pelvis, the following procedure was employed: Uretereal catheterization was done and a separate collection was made from each kidney. This was centrifuged, and a stained smear was made and examined microscopically. After the collection was completed, the kidney pelvis was gently filled, the gravity method being used in some instances and the syringe in others, with a one per cent. solution of mercurochrome-220, the catheter being plugged and the fluid retained in the pelvis for five minutes. There has been no complaint of pain and no severe reaction in any of our cases. This procedure was repeated twice a week, and when the urine from each kidney was free from pus and organisms for a week, the patient was discharged to return for further observation in a month.

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In the treatment of bladder conditions, the urethra was first irrigated with sterile water, a coudé catheter was passed, and the bladder was washed clean. One ounce of one per cent. mercurochrome-220 was then injected into the bladder through the catheter by pressure from a bulb syringe, or by a Keyes syringe. The patient was instructed to retain this solution for at least one hour, and longer if possible. Some patients have been able to retain the solution for more than three hours. This procedure was carried out twice a day, as a rule, and in some instances three times a day. There was occasionally some slight burning and smarting, which lasted only a short time. Several complained of smarting of short duration after three or four treatments, but not at first. The urine voided by the patient on arising in the morning was centrifuged. A stained smear was made and examined. After three or four treatments, the urine usually began to clear up, and as soon as it was free from organisms, the number of treatments per day was gradually reduced. It was noticed that as long as mercurochrome-220 was used in the bladder, the urine remained hazy owing to the presence of exfoliated epithelial cells, and not of pus and organisms.

Results in Urethritis

The bacteriologic tests of the action of mercurochrome-220 on the gonococcus have not been completed as yet and will be published later.

In fifty-one cases of acute specific urethritis, treatment has been given by intra-urethral injections of one per cent. solutions of this drug. These were all public dispensary cases, and a large number of the patients were negroes, many of whom failed to co-operate, while others failed to continue their treatment after the discharge began to diminish, especially if they had no complication to cause

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them pain or annoyance. In none of these cases have we seen any irritation beyond a temporary burning or smarting, whether the drug was used on the anterior or in the posterior urethra.

The method used in these cases has been: Microscopic diagnosis as to the presence or absence of gonococcus; the three glass test to determine the part of the urethra involved and the extent of involvement, and an examination of the prostate and the vesicles on the first visit. We did not examine the urethra with a bougie à boule, owing to the presence of an acute discharge. An anterior urethral irrigation of warm sterile water or dilute (1:10,000) potassium permanganate solution was then given. This was followed by the careful injection into the anterior urethra of sufficient one per cent. mercurochrome-220 solution to fill completely the anterior urethra, the patient compressing the lips of the meatus and retaining the solution for five minutes. If the posterior urethra was involved, the solution was gently forced into the posterior urethra by means of a bulb syringe, and was retained in the bladder for an hour or more. A small quantity of the drug solution and a blunt nosed urethral syringe were dispensed, and the patient was instructed to inject the solution four times a day immediately after urinating, retaining it for five minutes. On return to the clinic, smears were examined microscopically, and as the organisms lessened in number, the number of injections was reduced to three and then to two and later to one per day. The reduction should be gradual. As long as the drug is used the urine will remain cloudy owing to exfoliated epithelial cells, which will be found stained pink, while the polymorphonuclear cells will not be stained by this drug.

We were able to follow thirty cases until an apparent cure was effected. This involved in some cases the treatment of preexisting or consequent prostatitis, vesiculitis or stricture. In such cases a cure

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was considered accomplished when the urethral discharge had disappeared and the urine remained free from shreds for two weeks. It was found very difficult to secure the co-operation of this class of patients in the treatment of residual prostatitis, when all urethral and urinary signs had disappeared.

Twenty-one other patients were improved and discontinued treatment. The average length of time required to render the discharge free from gonococci was ten days. The shortest time required to accomplish this was three days. These were acute cases, two of which remained free from further infection, but in one case there was a recurrence of organisms after nineteen days, due to a reinfection from the prostate. The longest time required to render any case gonococcus-free was seventeen days. This was an acute exacerbation of a chronic infection, with involvement of the posterior urethra and the prostate.

Recurrence of organisms took place in six cases, or twenty per cent. of our total. Two of these six were cases in which the anterior urethra alone was involved, and the recurrence was probably due to stopping the injections before the entire canal had been sterilized. Four of these recurrences were in cases having both anterior and posterior involvement. Epididymitis developed in two of these cases, and in one case strictures were found subsequently in the bulbous urethra.

The anterior urethra alone was involved in eighteen cases, or 60 per cent. of our series, there being anterior and posterior involvement in twelve cases, or forty per cent. at the time the patients first presented themselves for treatment. Chronic prostatitis was found to be present in fifteen cases, or fifty per cent., on first examination. Three cases, or ten per cent., developed complications after treatment was begun. In two cases that were anterior when first seen, posterior

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urethritis and epididymitis developed, and in one, acute prostatitis and seminal vesiculitis were later complications.

In our series of cases there has been no irritation beyond temporary smarting at the time of injection. We have not observed the edema of the urethra and prepuce that is occasionally seen when other drugs are used. Following the first injections there is a slight increase in the amount of the discharge, which rapidly becomes mucopurulent, then serous as it diminishes in amount. With this change in discharge, the microscopic character of the discharge also changes. At first the polymorphonuclears predominate, and later the epithelial cells increase in number as the polymorphonuclears diminish. As the epithelial cells increase in number and the organisms disappear, the number of daily injections should be reduced gradually, taking about a week to entirely discontinue the drug. Any remaining catarrhal process in the urethra should be treated by the use of dilute potassium permanganate solution (1:10,000) as a daily irrigation or silver nitrate 1:10,000. When the posterior urethra is involved, it frequently clears up before the anterior urethra, in some instances only three or four injections being necessary to render the urine in the third glass clear. Care should be taken to eliminate reinfections from prostate and vesicles and urethral strictures by proper attention to these conditions when presented. The results obtained with mercurochrome-220 in gonococcal infections have been fairly uniform. The rapid disappearance of organisms in some cases has been striking. In others there has been more or less resistance to treatment. While our series is small, the results thus far obtained seem to us to warrant a more extended trial of this drug in these infections.

Chancroidal Ulcerations

As a result of the laboratory tests demonstrating the penetrability and germicidal activity of mercurochrome-220, it was decided to

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use it as a local application in the treatment of non-syphilitic venereal ulcerations. Fourteen dispensary patients were treated with the local application of mercurochrome solutions. We were able to follow ten of these patients until healed. In four cases an initial treatment was administered and some of the solution was given for local use, but the patients failed to return for further treatment and observation. All these cases were negative on repeated dark field examination for *Spirochaeta pallida,* and gave negative Wassermann reactions. No cases are included in which the patients were found to be syphilitic or were receiving intravenous arsenical medication. The type of sore was that of the old sore with undermined edges and dirty necrotic base which showed no tendency to heal.

These sores were thoroughly cleaned with soap and water, and all the necrotic tissue was removed. A moist dressing of one per cent. mercurochrome-220 was then applied, and some of the solution was given the patient with instructions to moisten the dressings twice a day with the solution. Later it was found more convenient to use a starch paste containing five per cent. mercurochrome-220 by weight, instead of the solution, the sore being dressed only once a day. No irritation or burning was complained of by any of our patients.

Conclusions

1. Mercurochrome-220 is experimentally a drug of great germicidal value, a solution of about 1:1,000 killing *B. coli* and *Staphylococcus aureus* in urine in one minute. It has practically fifty times the germicidal strength of acriflavine in urine medium for exposures of one hour.

2. In a strength of one per cent. the new drug is tolerated by the human bladder for from one to three hours without irritation.

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Injections of one per cent. solution into the renal pelvis are likewise free from pain, even when held in situ by plugging the catheter.

3. That mercurochrome-220 has a remarkable germicidal value is shown by the rapid sterilization accomplished in a series of cases of cystitis and pyelitis of long standing and refractory to other treatments. Now for the first time we feel that we have a method of quickly curing certain chronic infections of the bladder. The rapidity with which a few cases of old purulent cystitis disappeared was surprising, becoming free of pus and bacteria in a few days.

4. Studies of the comparative value of acriflavine and mercurochrome-220 in gonorrhea are not yet complete, but it has been demonstrated that with both drugs, methods of great value in the treatment of the disease have been produced.

5. Mercurochrome-220 has proved to be eminently satisfactory in the treatment of chancroids and as a dressing for buboes after incision.

Med.

GONORRHEA

The Cure of Gonorrhea. Gonorrhea and Marriage. (U. S. Public Health Service.)

Gonorrhea is Usually Curable. With proper care the large majority of both men and women who acquire gonorrhea can recover completely. The problem of gonorrhea from the standpoint of public health is less that of ultimate cure, than that of prolonged infectiousness. Precisely what percentage of cases is ultimately cured cannot be stated in statistical form at the present day, since so much of the disease never even gets to the attention of those in position to estimate, much less record, its frequency. It is certainly very large. It must be apparent that an infection which is as effective as gonorrhea in producing childlessness, must have had some check up-

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on its career, or it would long ago have extinguished the race. This check is the almost spontaneous tendency which the disease exhibits to run its course and get well. If actual and apparent cure were identical, and an acute gonorrhea really ended with the cessation of gross signs and symptoms, the situation would be relatively simple from the public health standpoint. It is, as has been said, the chronic phase of the disease and the long duration of the infectiousness of it in cases in which the process seems to be no longer active that perpetuate its hold upon us. With reference to the duration of this infectiousness Keyes estimates that the average persistence of the germs of gonorrhea in the male urinary canal is six months and persistence over eighteen months is exceptional. He states that he has not known a gonorrhea to remain potentially virulent more than two or three years, although he believes this proves the possibility of indefinite infectiousness in some cases. In women, while the patients usually recover in a few months (Keyes) the exceptions are of more indefinite duration, harder to recognize, and more difficult to treat. No one is willing to set a limit on the period of a woman's infectiousness, and conservative observers have the greatest hesitancy in naming a time at which a woman may regard herself as cured and no longer capable of transmitting the disease.

The Carrier of Infection the Real Danger. The fact that it is not its incurability, then, so much as the activity of carriers of infection, which perpetuates gonorrhea, points the way to effectual control. So long as individual caprice rather than respect for the public health governs the treatment situation and makes most cases carriers for considerable periods before cure occurs, we can expect no encouraging change in the picture. When dispensary patients can make one visit and disappear, when private cases vanish as soon as the discharge "dries up," when thousands of cases never have

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more skillful care than that afforded at the corner drug store, it is immaterial whether gonorrhea is curable or not, since so much of it is permitted to move through ordinary life without let or hindrance. Education of the public, not to the curability, about which they already have an unwarranted optimism, but to the prolonged infectiousness, the difficulties of the treatment, the obstinacy of the disease, will be more likely to provoke action. Once the public grasps the situation, cure will become compulsory and therefore attainable in nearly every case, and carriers, intentional or unintentional, will be isolated as far as opportunities to transmit gonorrhea are concerned, with the thoroughness with which typhoid and diphtheria carriers are today.

Modern Tests for Determining Infectiousness and Cure. The modern tests for the identification of gonorrhea in a doubtful case and the tests to determine its cure should be summarized because one of the surest ways to bring about their general adoption is to familiarize the public with what to expect of those who treat the disease, and incidentally, what must be provided for, in a public movement against it. The detection of an acute early gonorrhea while sometimes possible without the microscope should usually be made with it by recognizing the germ in the discharge. A point of great importance, often overlooked, is that every patient with a discharge from the urinary canal, gonorrheal or otherwise, should be examined for coincident evidence of the presence of syphilis, since an unknown but probably surprising percentage of gonorrheas mask the beginning of syphilis. In chronic gonorrhea, the microscope becomes even more important in the examination of shreds in the urine after massage of the prostate gland or other special manipulations, in cases of "morning drop," etc. A single examination is not sufficient to show the absence of the disease especially in women and three or four examinations or even more may be needed. In women more than in

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men, the absence of a discharge or leucorrhea is no evidence of the absence of the disease. Its stronghold is in the glands and these must be searched, sometimes with the aid of special instruments, in cases in which there is reason to doubt ordinary findings. Sometimes it is necessary to try to grow the germs to prove they are gonococci. There exists also a blood test for the presence of gonorrhea, recently devised, which rests upon principles similar to those governing the blood test in syphilis, to be described later. The blood test, while new, seems to be gaining ground as a valuable means of recognizing cases in patients that otherwise seem to be well. Among all these elaborations and technical details, use of the microscope stands out conspicuously. Any agency—from the clap-quack and drug clerk through the dispensary to the licensed practitioner of medicine—which is treating gonorrhea without the use of the microscope is playing a gambling risk against the patient, trading on luck, and contributing directly, without excuse or extenuation, to the aid and comfort of the enemy.

Gonorrheal Childlessness in Men and Women. Much that should be summarized under this head has been suggested in the foregoing discussion. In men, gonorrhea, aside from the risk of infecting the wife, which exists in an uncured or latent case, unfits a certain percentage for marriage through the effect of the inflammatory process on the sperm or male sexual elements, and the ducts or tubes through which they pass. Sterility in the husband is variously estimated as responsible for from 17 to 25 per cent. of childless marriages. It should be understood that the ability to have sexual relations may exist in sterility. It is the failure of the relation to result in pregnancy that constitutes the sterility for which the gonococcus is responsible. It is one of the supreme ironies of fate to have the woman in a childless marriage appear before the physician, ready to submit herself to

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every manner of procedure, including even serious operations, in the hope of curing a sterility for which the husband is responsible, while he, as Morrow says, goes about "inflated with a sense of his own virility." Such charges of sterility in the wife, for which the husband is directly or indirectly responsible, have formed the basis of separations and even of actions for divorce. Fortunately it has now become well understood by the medical profession that proper examination of the husband to prove that he has living active male elements is essential as the first move in determining the cause of a sterility. Yet it should not be imagined that all male sterility is due to gonorrhea. For example, Simmonds estimates that 61 per cent. of alcoholics are sterile. Moreover it must never be forgotten that the reproductive function is one of the most complicated of physico-chemical mechanisms and a marriage may be childless even in the face of the entire good health of husband or wife. The layman's snap judgment on the presence of gonorrhea in a childless couple therefore has at least an even chance of being wrong instead of right. Certain forms of sterility in the man due to the effects of gonorrhea are not incurable, the outlook depending somewhat on whether active male cells exist or not.

A Child Unborn. The burden of gonorrhea in marriage falls overwhelmingly upon the woman. While some men are the unfortunate victims of their wives' infection the rule usually works the other way. Estimates of the percentage of men who transmit their gonorrheas to their wives vary widely from 5 to 45 per cent. Aside from the invalidism already discussed, for which gonorrhea is responsible in marriage, its influence on the perpetuation of the race is, as such, exceedingly serious. As previously noted, about 50 per cent. of all absolute and one-child sterility is due to gonorrhea, and of this sterility, 75 per cent. is the result of gonorrhea transmitted

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to the woman by her husband. The loss to the good of the world which an unborn child represents is in no sense to be measured by its mere place in a numerical series, large though this be. In no trivial sense the child is the personal immortality of its bearers and of the race. A child unborn is a defeated purpose and a bond unbound. Being unborn is more costly even than death, since the experiences of childbirth and death are at least part of that discipline without which man and wife rarely reach the full development of their character and personality. The woman who through gonorrhea has not known the bearing and rearing of a child carries an inevitable and tragic handicap—she is indeed the victim of an unfulfillment whose poignancy can never be subjected to mere statistical estimation.

Gonorrhea and the Medical Examination Before Marriage. The protection of marriage from the effects of gonorrhea is one of the critical eugenic problems of our time. It is beset by difficulties which are part and parcel of the status of the genital infections in our social order, and of the medical problems involved in the recognition of gonorrhea itself. It may be said to begin with, that so long as public sentiment does not compel the revocation of the laws in force in most states which oblige the physician to remain silent under the so-called bond of professional confidence while selfish and irresponsible men and women, knowing themselves to be in an infectious state, or indifferent to the question, deliberately marry healthy partners, a certain amount of marital infection will persist. *Such a revision of the law is among the first essentials of any attempt to control carriers of the disease.* On the other hand, the gonorrhea transmitted in ignorance by inadequately treated and uncured cases is a much larger part of the problem, which will only be fully done away with through the reform of the whole situation which public enlightenment will bring. Medical examination before marriage,

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while it has not yet reached the status in public sentiment and law which it deserves, is a powerful weapon against every type of gonococcus carrier. It is true that the result of such an examination is less trustworthy in women than in men, since an antiseptic douche can conceal the actual status of the case; nevertheless repeated examinations properly carried out can often demonstrate the infection if present. Widows, particularly childless ones, no matter what their personal character, and non-virgin women, are legitimate objects of medical suspicion. It is true that in isolated cases, no satisfactory conclusion can be reached, although such cases are rare exceptions. Medical examination of men is irksome to physician and patient, but capable of more trustworthy results. While urination before examination may wash away a morning drop, massage of the prostate gland in the office, followed by a so-called two-glass test and microscopic examination will usually identify a gonococcus carrier, and examination of the urinary canal with an instrument called the endoscope may yield findings that point toward the persistence of an infection. The mere absence of discharge in a man who has had a comparatively recent gonorrhea is never to be trusted as evidence of fitness to marry. Neither is the cursory looking over too often given such cases to be regarded as satisfactory. The development of blood test for gonorrhea may offer a valuable aid, but one whose status is as yet not fully determined. Every man who has had a gonorrhea—and this, it will be recalled, includes about 50 per cent. of all men—should be willing to submit to thorough examination by an expert chosen by the family of his fiancée, as an evidence of his moral as well as physical fitness to become her husband. The completeness of the examination should be left to the expert's judgment.

Protection of the Fiancée. When gonorrhea complicates an engagement, as it too often does, there is only one principle to follow;

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postponement until a cure has been effected, and that, a cure determined by the microscope and time, and not by the patient's impatience and desires. Here again a new conception of the physician's higher obligation to society will allow him to state the facts to the healthy person if the infected individual shows an intention to marry before he is cured, a form of forced control of the situation that is too often the only way of aiding the woman. These occurrences are anything but remote, as any expert can attest, and until they are dealt with, the problem of gonorrhea in marriage will remain unsolved.

Protection of the Pregnant Woman Against Gonorrhea. The seriousness of pregnancy as a complication of gonorrhea demands special medical measures, both for the sake of the mother and of the child. The examination of women who have such symptoms as "vaginal abscess," burning urination, leucorrhea and abdominal pain soon after marriage or during pregnancy, and of unmarried mothers especially, for evidence of gonorrhea, is of the utmost importance. The examination should be made early in the pregnancy if possible to allow for painstaking and systematic treatment before the birth of the child. The life-saving value of such a measure is so great that it should under no circumstances be neglected.

A Warning in Regard to Double Marital Infection. It should not be forgotten, as an explanation of more than one embarrassing or tragic situation, that the fact that a man and wife live together or have sexual relations without showing evidence of gonorrheal infection may be due to the simple fact that both have it, albeit in a mild or quiescent form. The separation of the parties to such a marriage or liaison leave two sources of infection free to communicate their ailment to others, the more easily because, having failed to note any evidence that they had infected each other, they would believe

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themselves to be normal. Similarly, the treatment of one party to a marriage for gonorrhea calls for the examination and treatment of the other, since it is only under the rarest of conditions that one has the disease without the other, or that the one can be cured while subject to repeated risk or re-infection by the other.

Remediable Weaknesses of the Existing Situation. This completes for the time being the consideration of the medical aspects of gonorrhea which affect its status in a public health campaign against diseases of sexual origin. Age-long underestimation of its seriousness has become part and parcel of common thought, and only prolonged and persistent effort at re-education will finally give the disease the place it deserves in the public mind side by side with syphilis, tuberculosis and cancer, as one of the four greatest surviving plagues of the human race. This undeveloped public sentiment is coupled with a medical handicap that is yet to be overcome. Slowness and some uncertainty in treatment, the absence of the spectacular, and the unfamiliarity of the medical profession with certain new and vitally important methods for the recognition of the disease in active and in latent, though still contagious cases, deprive a campaign of some of the dash and brilliancy possible in syphilis, but form no insurmountable obstacles. Too few great minds, it would almost seem, have made the biology, the physiology, the chemistry of the gonococcus, and the body which it invades, their life-work. Throughout this field as throughout all fields of medicine, the temporizing, hand-to-mouth treatment of consequences rather than causes has held the center of attention. An expenditure of effort and brain power equal to that which has been lavished on the results and the wreckage of gonorrhea, if expended upon its early stages, on the control of its carriers, and on its prevention, would, within a generation or two, lead to new knowledge that should reduce it to a position of minor

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importance in the ranks of disease. It is not the association of gonorrhea with a moral issue such as that of prostitution which maintains its foothold. It is our own refusal in the past to deal with it radically as a dangerous infectious disease wherever it may be found. The fact deserves re-emphasizing, that in spite of its peculiar obstinacies, in spite of the lack of dramatic and rapidly effective methods of attack, continued insistence upon the contagiousness of gonorrhea, determined focusing of every effort against it, upon its transmissible stage and upon its transmitter, can even today remake our point of view, and begin the abolition of the disease. When gonorrhea is universally understood to be almost as common as measles and more terrible than smallpox—a disease which thrives on lies and cowardly silence—the way will open for a new public health.

Med.

GONORRHEAL CONJUNCTIVITIS

A Case of Gonorrheal Conjunctivitis Which Was Cured with Remarkable Speed by Intravenous Injections of Arthigon. (Ueber einen durch intravenöse Arthigoninjektionen auffallend schnell geheilter Fall von Conjunctivitis gonorrhoica.) Dr. A. Sommer. Dermatol. Wochenschr., Leipzig, No. 21, 829.

A girl of nine years, with gonorrheal infection of the genital organs, had gonorrheal conjunctivitis of the right eye. There was abundant greenish-yellow pus and the eyelid could only be opened by causing intense pain. The bacteriological examination showed numerous gonococci.

Treatment: The left eye, which was intact, was at once protected by a watch-glass collodium dressing. Frequent irrigation of the conjunctival sac of the affected eye with a potassium perman-

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GONORRHEAL CONJUNCTIVITIS

ganate solution. Dropping into eye a few drops of a 2 per cent. protargol solution twice daily and on the first day .05 c. c. of arthigon intravenously. On the third day injection of 1 c. c. of arthigon. On the fourth day all severe symptoms disappeared and on the fifth day the conjunctivitis was completely cured.

Med.

GOUT

The Dose of Colchicum in Gout. Dr. J. S. Matthews. Brit. Med. Journ., London, 271.

According to most authorities colchicum is a specific in gout. Dr. M. considers the acetic extract as the most effective preparation of colchicum. But the dose usually employed is much too small. Instead of ¼-1 grain, Dr. M. uses 2-6 grains. He gives the following prescription:

℞ P. opii ..... Gr. j.
P. ipecac ..... gr. j.
P. cambog ..... gr. ij.
P. aloes ..... gr. iv.
Extr. colch. acet ..... gr. viii.

Misce.: fiat pil. div. in 4. Mitte 12 or 24.

Dose: One pill three times a day.

Dr. M. states that the average dose mentioned rarely, if ever, fails to relieve rapidly and completely all symptoms, especially in acute cases.

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Med.

HAY FEVER

Treatment of Hay Fever with Optochin Hydrochloride. (Die Behandlung des Heufiebers mit Optochinum hydrochloricum.)

Dr. Haike. Deutsche med. Wochenschr., Berlin, No. 25, 684.

The good results obtained with optochin in eye affections (photophobia) induced Dr. Mühsam to try it in hay fever. He used the following solution as a spray for the nose:

Optochin. hydrochlor.	0.25
Glycerin pur.	2.00
Aqua dest. ad	25.00

But the author of this article found that under certain conditions (deformed septum, turbinate swellings, etc.) this treatment is insufficient. He therefore carried out the following method: The nose is cleaned from all secretions; swellings are treated with a cocaine spray. The nose is then carefully swabbed out with the 1 per cent. solution given above. A few drops are passed into the conjunctival sac after it has been anaesthetized with a drop of a 1 per cent. solution of cocaine. This treatment is continued a few days until the irritation is allayed. After this the swabbing is applied only every third day, the patient applying a daily spray of the solution himself. This treatment is simple and superior to any other.

Med.

HAY FEVER

The Treatment of Hay Fever. (William Scheppegrell, U. S. Public Health Service.)

Hygienic measures are as important in the control of hay fever as they are in the case of typhoid fever, malaria, yellow fever, and other preventable diseases. By living in a weed-infected neighborhood a patient greatly increases the difficulties of his immunization and frequently necessitates the raising of his immunity to 85 per cent.

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when ordinarily 70 per cent. would be sufficient. In all cases treated at the Hay Fever Clinic at the Charity Hospital, patients are given charts of nine blocks of their neighborhood, with instructions to locate there on lots that are infested with weeds. When this has been done, the charts are sent to the city board of health, which notifies the owners of the lots to cut the weeds under penalty of prosecution for violating the grass-weeds ordinance.

In order to demonstrate the efficiency of such measures, the American Hay Fever Prevention Association in 1916 employed special inspectors to cooperate with the regular force of the New Orleans Board of Health, with the result that the number of spring hay fever cases of that year was reduced to less than 50 per cent. As the fall hay fever in Louisiana is due to the ragweeds, *Ambrosias,* whose potential radius is ten times greater than that of the grasses which cause spring hay fever, the benefit in the fall cases was much less marked, as the pollen blew in from the surrounding country.

In the selection of homes, hay fever subjects should choose localities distant from weed-infested areas. The pollen of the grasses, and of the summer hay fever weeds generally, does not ordinarily travel very far, and a mile is usually a safe distance. The pollen of the ragweeds and other fall hay fever weeds, however, is very buoyant, and in windy weather may travel three to five miles.

During their attacks of hay fever patients should avoid localities infested with weeds generally, and especially with those weeds to whose pollen they are sensitive. Should their neighborhood be infested with weeds, and a grass-weeds ordinance be in force, this condition should, in the interest of public health, be reported to the board of health.

During the hay fever season patients should avoid driving or riding into suburbs abounding in weeds. An attack resulting from

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this increased exposure may lower their resistance and make them more susceptible to the pollen of their own neighborhood.

A reasonable amount of exercise is beneficial; but this should be taken without increased exposure to the hay fever pollens. Swimming, especially in salt water, is an excellent form of exercise.

Considerable literature is published each year in the lay press regarding the benefit of the "cold storage" treatment of hay fever. As practically all ventilation is excluded in this treatment, there is an absence of atmospheric pollen, which is the principal cause of the relief which the patients experience. The low temperature, however, instead of being a benefit, is really a source of danger, as we have had several cases of bronchitis which resulted from such exposure. In any event, the relief is only transient and can be as well obtained in any room from which the pollen-laden air is excluded.

Effects of Rain

It is well known that a continued rain affords relief to hay fever patients. The action of the rain is to cause precipitation of the pollen floating in the air and to prevent more pollen from leaving the plant during the continuation of the rain. If this condition continues long enough the effects of the inhaled pollen pass off, and the patient has relief until the rain is over and a wind of sufficient velocity again fills the air with the hay fever pollen.

It has been supposed that the pollen which is precipitated by the rain may again be carried into the air and continue its irritating effect. This, however, is not the case. The principal varieties of pollen have been tested in our biological laboratory and it has been found that the submersion of the pollen in a large amount of water removes its toxic properties. After the pollen has been exposed in this way, it has been tested in large numbers in the

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nostrils of hay fever subjects without producing any apparent effect. Several hundred pollen were frequently inhaled without effect by hay fever subjects who ordinarily react to a small number of fresh pollen.

Screening, Masks and Inhalers

The result of this investigation is of practical value in certain cases of hay fever. When a hay fever subject has been operated on or is seriously ill from other causes so that the irritation of sneezing and other symptoms of hay fever would not only be annoying but even dangerous, the patient may be protected by having the windows of his room screened with thin cloth saturated with water. All pollen coming in contact with the moist cloth would not only be arrested but robbed of its toxicity.

When this method of screening is not practicable, a special inhaling mask, based on the same principle and serving the same purpose, may be arranged for the patient. There are on the market a number of widely advertised inhalers for the prevention of hay fever. The device is inserted into the nostrils, and a fine gauze is supposed to filter the inhaled air free from hay fever pollens. Aside from the question as to whether a mesh with openings of 0.05 cm. prevents the entrance of pollens 0.0015 cm. in diameter, we were unable to find a patient who did not prefer the hay fever to the discomfort of wearing the inhaler.

Diet

The diet of hay fever subjects during the hay fever season should be light as regards food rich in protein, such as meat, fish, eggs, cheese and milk. Farinaceous food may be taken in moderation. Vegetables are of benefit, as is fruit also.

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HAY FEVER

High seasoning should especially be avoided, as it frequently reacts on the membranes of the nostrils already irritated by the pollen. Alcoholic drinks are injurious.

In cases complicated by asthma, the rules regarding diet should be carefully observed, and it is preferable in these cases to have the principal meal during the middle of the day.

There are certain articles of food that should be avoided in special cases; but these vary within such wide limits that no specific rules can be formulated. In one case, for instance, an attack of hay fever could be aggravated by a piece of watermelon; in another by peaches. Mustard and pepper should be avoided, and occasionally, also, tea and coffee.

Surgical Methods

While abnormal nasal conditions in their relationship to hay fever have been given undue importance by some rhinologists, they should, nevertheless, be given careful consideration which tends to develop a hypersensitiveness of the nasal mucosa predisposes the patient to an incipient sensitization which tends to result in a persistent form of hay fever.

Marked septal spurs, ridges, or deflections, which cause a concentration of pollen in the obstructed nostril or which touch the opposite turbinal and thus cause irritation, congestion, and hypersensitiveness, may form an important predisposing cause. Infection of the sinuses, especially of the ethmoidal cells, should receive careful attention.

While the percentage of cures from operations on these cases is not high (10 per cent.) they should not be overlooked in the prophylaxis of hay fever.

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HAY FEVER

Nasal surgery in hay fever, however, should be avoided except in such conditions as indicated above. In other cases operations are unnecessary inflictions on the patient and are without benefit. One of our patients, a physician, had both inferior turbinals cauterized and then removed and the right ethmoidal cells eviscerated without benefit, and the surgeon had advised a similar operation of the left side. Another patient had nine operations performed, including several electrocauterizations, without perceptible benefit to his hay fever. These cases indicate not only the futility of excessive surgery, but also the distressing character of a disease that would make the patient submit to these repeated ordeals.

In hay fever the electrocautery has probably been used more frequently than any other surgical method. It is based on the idea that in hay fever there is an intumescence of the inferior turbinals which the cicatricial contraction following the cauterization is intended to relieve.

There are few cases, however, that have been benefitted by this method, and we have seen many patients who claim that their condition was aggravated by the cauterization. In view of these facts electrocauterization should be avoided in hay fever.

In a series of 707 cases (Series C and D) treated in the hay fever clinic of the Charity Hospital 8 per cent. had been operated on for hay fever without apparent benefit.

Constitutional Treatment

Calcium chloride or, preferably, the less irritating calcium lactate, is occasionally of benefit in hay fever. It should be given after meals in doses of 15 grains, well diluted.

In cases of hyperacidity, sodium bicarbonate in the effervescent form should be administered. The dose is 15 grains, three or four

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times daily. In one of our cases a seasonal cure resulted from the administration of 10 grains of quinine three times daily; in other cases it was without benefit. It is indicated that in this case malaria was the predisposing cause, which was corrected by the quinine.

In cases associated with asthma sodium iodide may be administered, preferably 10 to 20 drops of a saturated solution, three times daily, and well diluted.

Mercury has also been used in hay fever, and Barton L. Wright, of the United States Navy, reports several cases successfully treated. He prefers the succinimide of mercury, one-fifth grain in distilled water, this being injected deeply into the gluteal muscles. He believes that the effects are due to the fact that patients after a mercuric treatment have a peculiar power of resistance to infection of every kind.

Local Treatment

Menthol in the form of an oily spray is of benefit in some cases of hay fever, but aggravates the attack in others. Two grains to the ounce of liquid petrolatum is the usual proportion. The following formula gives temporary relief, but tends to establish the cocaine habit:

℞ Epinephrin sol. (1-1000).
2 per cent. sol. cocaine.
Normal saline solution, aa. f. 3 i.
Sig.: Two drops into each nostril as directed.

Solutions of cocaine and of epinephrin tend to develop a turgescence of the nasal mucosa which aggravates the hay fever. They should, therefore, be used only to give relief in severe paroxysms.

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HAY FEVER

The epinephrin and cocaine may also be used in the form of an ointment, but this should be prescribed with the same precaution as the solution.

For the conjunctivitis that frequently accompanies hay fever, 5 per cent. argyrol may be used, or the following may be prescribed:

℞ Sodii biboratis.
Acidi borici, aa. gr. XV.
Sodii chloridi, gr. III.
Aquae dest, qs. f. ℥ I.
Sig.: For eyes as directed. (Dispense in Stearn's container.)

Nasal Massage

As a means of reducing the hypersensitiveness of the nostrils before the opening of the hay fever season, and for correcting the intumescence of the nasal mucosa, which frequently remains after the paroxysms have subsided, we use a form of nasal vibratory massage. For this purpose a mechanical vibrator is used, which we first devised in 1908. It is operated by compressed air under a pressure of 50 to 60 pounds. The air drives the piston forward and backward in the cylinder, and this imparts a vibratory movement to the nasal applicator. The arrangement is such that the operation of the applicator in the nasal cavity can be observed. Cotton is attached to the end of the applicator, and a 4 per cent. solution of iodized phenol in glycerin is applied to the cotton.

By means of this instrument, a vibratory massage is applied over the inferior turbinal septum and the lower portion of the middle turbinal. At first the massage is made very lightly and only for a short time, but the action is gradually increased as is also the length of time application. The massage is usually applied two or three times weekly.

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HAY FEVER

Vibratory massage is a useful supplementary treatment, and, in a small percentage of cases, has resulted in a cure without other methods. It should be discontinued during the hay fever season, when the mucous membrane is irritated by the atmospheric pollens.

Pollen Therapy

In all cases in which pollen extracts are used, the diagnostic tests should be applied in order to determine the character and degree of the hay fever reaction. This test consists in injecting into (not under) the skin of the forearm five units of the pollen to be tested. These are determined by the pollenometric records, the principal pollens during the spring being from the grasses and, in the eastern, northern, and southern states, from the ragweeds in the fall.

For the convenience of our clinical records, the result of the intradermal tests is recorded on a percentage basis. A marked wheel, two or more centimeters in diameter, is recorded as 100 per cent., etc. While this is an arbitrary scale, it is valuable for purposes of comparison, and is much more definite than such terms as "mild," "marked," "severe," etc.

After the character and degree of sensitization have been determined, the preventive treatment is commenced by injecting five units of the extract of the pollen to which the patient is sensitive and to which he will be exposed. If he is sensitive, for instance, to the grass pollen, which is prevalent in the spring and early summer, this pollen extract is used for the spring treatment.

If the patient is sensitive to both grass and ragweed pollens, the preventive treatment for the grass pollen is commenced six weeks before the grass season opens, and for the ragweed pollen, the same length of time before the commencement of the ragweed season. We do not consider it advisable to use the combined pollens in these cases,

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on account of the great difference in the seasons of exposure, and the variation in the degree of sensitiveness to these pollens.

The pollen extracts for the preventive treatment are usually injected two or three times weekly and gradually increased to 100 or 200 units. Large doses are not given because our injections of medium doses have given better results, and also because large doses may produce severe reactions, not only of hay fever and asthma, but also of eczema, urticaria, and angioneurotic edema.

As soon as the specific pollen appears in the atmosphere, as shown by the pollenometric records, the injections should be reduced to 20 to 30 units, as the patient is then exposed to the atmospheric pollens.

Pollen and Vaccine Therapy

While our experience has shown that pollen therapy is useful in the treatment of hay fever, we found that there were many cases in which this form of treatment alone did not give satisfactory results. With the majority of patients, therefore, this was combined with the vaccine therapy. The selection of the form of treatment varies according to the patient's condition, which is influenced by the number of atmospheric pollens which he is inhaling, and this, in turn, depends upon the season and the velocity of the prevailing wind. During the early part of the season, when the grasses and weeds are beginning to pollinate, and toward its end when pollination is nearly completed, the number of pollens in the air is relatively small and the patient's attacks are light. During the middle of the season, however, the number is greatly increased with correspondingly increased suffering of the patient.

The principal cause of the increase in the hay fever paroxysms is due to atmospheric disturbances during the active pollinating sea-

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son. During a light wind, one to six miles per hour, pollen is carried only short distances; while in high winds, fifteen to twenty-five miles per hour, pollen in large quantities is carried to great distances (five miles or more), so that the number may reach 300 to 400 pollens per square yard of air. During the prevalence of such winds, all hay fever patients in the vicinity of, and who are sensitive to these pollens, suffer greatly.

If the patient applies for treatment during a severe period, the pollen extracts are usually ineffective and a vaccine should be used, this being injected at intervals of one or two days until the severity of the attack subsides. The pollen extract is then used, the vaccine injections being resumed if a severe paroxysm develops.

Our reason for using the vaccine during severe paroxysms is that at this time the patient is suffering not only from the effects of the pollen, but also from the great increase in the pathogenic microorganisms resulting from the lowered resistance of the respiratory membranes. The use of vaccine therapy at this stage is, therefore, logical, and has given us satisfactory results. In a few cases (8 per cent. of a series of 707 cases) the treatment of the successful ones was limited to vaccine therapy only.

The question of autogenous and stock vaccines has been carefully considered in our cases. The autogenous vaccines are preferable, provided they can be obtained of the proper standard and purity. When there is any doubt regarding this, the stock vaccines of unquestioned reliability should be given the preference.

We use three forms of vaccines, each containing to the c. c. 1,000 millions in various proportions of the following microorganisms: B. Friedländer, M. catarrhalis, pneumococcus, streptococcus pyogenes, staphylococcus aureus and albus. As soon as the acute attack has subsided, the extract of the pollen, which has been determined to be

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responsible for the patient's hay fever, is injected, the dose being 15 to 80 units, which is used at intervals of two or three days.

The exact dose is determined by the reaction in the diagnostic test, careful records of which are kept for each patient. When the reaction has been marked small doses (15 to 20 units) are used, while in other cases this is increased to 20 to 40 units.

Should an acute attack again develop, the bacterial vaccine is substituted for the pollen extract, from one to four injections being made. In many cases, one injection is sufficient to control the symptoms.

In all cases, the treatment is discontinued when the pollenometric records show that the atmospheric pollens responsible for the attack have disappeared. Before this time, however, the treatment is discontinued when the report of the patient indicates the control of the hay fever. In discontinuing the treatments they are at first made at increasingly longer intervals before being stopped entirely.

In spite of the large number of injections, there have been no cases of infection nor of anaphylactic shock. Tincture of iodine is applied to the skin before and after each injection, except in the diagnostic test, in which case alcohol is applied first and then iodine after the test has been completed.

No restrictions were made regarding the diet in Series C of 400 cases, except in one case in which the symptoms were aggravated by eating peaches or watermelons. Except in this series, we instruct patients to maintain a diet low in proteins, and to refrain from articles known to cause anaphylactic disturbances, such as fish, crabs, shrimps, strawberries, etc.

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HAY FEVER

Results of Treatment

From an analysis of the result in Series C and D (707 cases) we find that there were seasonal cures in 49 per cent. of the cases and marked improvement in 40, or satisfactory results in 89 per cent. of the total number.

In 4 per cent. of the cases, there was little or no perceptible improvement, and 7 per cent. discontinued the treatment before the results could be noted. In no case was there any aggravation of the hay fever symptoms from the treatment or other ill effect.

"Seasonal cure" in these cases indicates that there were no more hay fever symptoms for the remainder of the season. Before the opening of the following hay fever season, these cases are again given the diagnostic test. If this is positive, the treatment is repeated. In cases of recent origin, one course of treatment is usually sufficient, but in cases of longer standing two or three courses are required. In some of the cases treated during previous seasons there was no apparent improvement, but the patients had relief from the hay fever symptoms the following season.

The reason for the difference in the effects of pollen injections is not clearly established. Cooke, Flood, and Coca suggest that if the resulting resistance is due to a gradual saturation or neutralization of an anti-bodylike substance with the active pollen substance, the union of these two bodies is a much less firm one than that in the more susceptible individuals, and that the active pollen substance is discharged from such a combination and eliminated much more quickly in the former than in the latter.

While the average results in these cases are satisfactory, we believe that the number of seasonal cures will be considerably larger when the advantages of the preventive treatment of hay fever are better understood. In the majority of cases in this series, especially

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HAY FEVER

in the hay fever clinic, the treatment was not begun until the hay fever had actually developed, when the use of pollen therapy is not as effective as the preventive treatment

Med.

HEART

Rhythm Couplé. Revue de Medecine. Paris.

Ch. Esmein of Paris reports a number of cases of dilatation of the heart with couplé-rhythm treated with ouabainé with excellent results. In none of the cases were there any unfavorable results shown from the administration of ouabainé, although in several of the cases there was a marked degree of chronic nephritis, an affection in which there is a very limited degree of tolerance to cardiac tonics. He calls attention to the fact that clinicians have not been able to get satisfactory results in the treatment of this syndrome. Its paradoxical reaction to digitalis is disconcerting. It would seem that the administration of digitalis should prove almost specific, however, it not only does not ameliorate the condition, but frequently aggravates it. Although this assertion seems singular, it is, nevertheless, true. Huchard was the first to establish this fact, by publishing the history of a series of cases, displaying cardiac insuffiency, with very large heart and a tendency to couplé-rhythm, all of which showed exaggeration of the dimensions of the heart on the administration of digitalis, although given according to the most classic rules, and also augmentation of the couplé-rhythm and the cyanosis, and in several cases sudden demise after a short time.

A little later Merklin reported observation of the same nature. His patients, like those of Huchard, displayed an aggravation of symptoms on the exhibition of digitalis, an increase of the couplé-rhythm and of the cardiac distension; diminution of diuresis, fainting

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and vomiting. Two dying of syncope after a brief delay. More recently these conclusions have been constantly verified by other observers.

It appears clear that cardiac insufficiency, distension and couplé-rhythm furnish a syndrome apart, in which reside a hostility to digitalis. Nor is this all; in the same group we find all the substitutes for digitalis are inefficacious, although less harmful. It is equally true also of the different indirect forms of cardiac medication. In fact there is nothing in the classical arsenal that gives satisfactory results. And today the opinion is prevalent, that cardiac insufficiency with extensive dilatation and rhythm-couplé constitutes a state beyond the resources of the art. However, according to the claims of Esmein a great advance has been made in cardiac therapeutics by the use of ouabainé, which we owe to M. Vaquez.

Ouabainé (Crystallized Strophanthin) C_{30}, H_{46}, O_{12}, $9H_2O$ Glucoside from Acocanthera ouabainé or as now prepared from Strophanthus gratus. Bitter, colorless crystals soluble in 100 parts of water or alcohol, slightly soluble in chloroform or ether. Used in place of Strophanthus as a substitute for digitalis by intra muscular or intravenous injection.

Dose: 1-120 gr. (0.0005 Gm.) once in twenty-four hours. Initial dose should be small, gradually increased.

Med.

HEMOPHILIA

Prolonged Serum Treatment in Hemophilia. (Le traitement sérique prolongé dans l'hémophilie.) Dr. E. Weil. Bull. Acad. de méd., Paris, No. 37, 374.

Already in 1907 the author reported the case of a hemophiliac whom he had treated with repeated injections of human or animal

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HEMOPHILIA

blood serum. Every third month the patient received an injection of 20 c. c. of serum. During all the years the patient followed this treatment he never showed any signs of the hemorrhagic diathesis. Since then six other patients were treated in the same way and with similar success. The author insists, however, that the treatment, to be successful, must be repeated every third month. He mentions as a curious fact that in no instance he observed any serious phenomena of anaphylaxis.

Med.

HEMORRHOIDS, Calomel Treatment

A correspondent in Ugeskrift reports that calomel dusted over the surface of hemorrhoidal tumors will relieve the pain quickly and that a few applications will cause the tumors to shrivel up. Previous to making the application the parts must be dried thoroughly.

Hemorrhoids Treated by the Injection Method

Brockbank recommends injection of urea and quinine hydrochloride. The technique is very simple; the rectum should be made aseptic and the hemorrhoids drawn down and three or four drops of the solution are injected into the base of the tumors, avoiding the veins. This causes the pile to swell and cuts off the circulation and the hemorrhoids disappear in ten days or two weeks.

Med.

IDIOCY

Mongolian Idiocy, Treatment of, by Mixed Glands. By Dr. W. N. Berkeley.

This brief report has no solution to offer for the pathological puzzle presented by Mongolian idiocy. The vast literature on the

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subject has served only to increase the difficulties of the etiological problem.

We are told that the patient is usually one—often the only abnormal one, and often the last born—of a large family of children. H. H. Goddard has collected statistics of 294 Mongol children, of whom 51 per cent. were the last born of families of more than one child. This seems to be of some significance; but, on the other hand, the last four patients of this class recently brought to my office were first born, and all were the only children of their respective parents. The problem is further complicated by reports of twins, one of whom was Mongolian, and of twins both of whom were Mongolian. There are quite a few reports of two Mongols in one family of children, and Babonneux and Villette have recently described four cases in one family. The father was a mason—in good health at the time of the report. The mother died at fifty-seven years of pulmonary tuberculosis. During her childbearing age she had first two miscarriages, then in succession, and at term, ten children. Six of these died in infancy—mentality undetermined; the four surviving offspring were all Mongolians. Such a horrid narrative might well have served for the original of Joseph Conrad's dreadful story.

But little or no evidence has been adduced to indicate any hereditary or racial element in the problem. The fathers are often unusually clever—good business men, successful musicians, cultivated linguists. Maternal ages run all the way from sixteen to fifty-five (Goddard), and many of the mothers have been exceptionally intellectual. There is no ground for believing that the Jewish race is in any essential measure exempt from the accident (Herrman). Rolleston has complicated the pathological anatomy still further by reporting the weight of a Mongolian brain removed at autopsy at one year of age as heavier than the average for normal babies.

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IDIOCY

In respect of the symptomatology, we need hardly stop to note the slanting "Chinese" eyes, the rough skin, coarse hair, red eyelids, and blunted occiput. The condition is recognizable in the newborn infant—even, so it is stated by one English writer, in the prematurely born fetus—and is apparently due to the early slipping of a cog in the mechanism of growth in the embryo; but more than this does not now appear. It is, however, a very definite and specific accident, marking the features of the child in such a specific way that many of them from far-distant quarters of the globe would pass for brothers and sisters in one family. Indeed, parents visiting an institution where a number of them are cared for often cannot pick out their own children from a group of defectives of the same class.

To conclude these introductory comments, it seems to be generally true that the patients rarely attain a mental age of more than five or six years. They are relatively non-resistant to intercurrent disease, and but few reach adult years. Pogue in an interesting account mentions one Mongol girl who married and became twice pregnant. One child miscarried; one was born at term, and was *not* a Mongolian.

Treatment

To pass on to the treatment; there have been efforts from time to time to alleviate and improve the condition—with but little consistency or success in the reported results. Thyroid extract has been tried, of course; and a few observers have written favorably of it. Thymus and pineal gland have also been recommended (Pogue). Ordinarily the medical attendant holds up his hands in despair, and assumes a nihilistic attitude.

In view, however, of the anguish the parents of these babies so often suffer, and having in recent years had pluriglandular defects

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very much in my field of work, I have taken a series of the cases under clinical observation for glandular treatment at my clinic and in my private work. In the hope, rather than the expectation, of benefit I have systematically administered to these patients a number of glands and glandular combinations; and I have latterly met with a degree of success which seems beyond accident or coincidence.

Omitting the steps of the process, it will be enough to say at once that with a pluriglandular combination of thyroid, pineal, pituitary, and testis (or, in girls, ovary), I have seen some gratifying results.

No one understands better than myself that such a clinical method of study is open to reproach. In the absence of a series of exactly similar cases as controls, which shall receive like hygienic and dietetic care, *without* the medicine, a rigidly scientific conclusion cannot be drawn. But such a series of controls the nature of the case pretty thoroughly precludes; and one must be content with a comparison of the child's mental and bodily growth for like periods of time, before and after treatment, and must observe a large number of cases. To these criteria my new treatment reasonably conforms.

It is not my impression that an improvement comparable to that following thyroid therapy in the cretin may be noted; but the parents, nurses, and physicians in charge of the cases have been unanimous in their praise and approval of the method.

It is hardly necessary to say that every case must be thoroughly examined. Roentgen plates of the skull are also helpful, and, when the parents are willing, the spinal fluid should be tested for the colloidal gold reaction, that there may be no possibility of complications. Syphilis has nothing to do with Mongolism, but the Wassermann reaction should be reported for the usual reasons.

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IDIOCY

It is also absolutely essential to use reliable drugs,—if internal secretions may be called drugs. To let the pharmacist advise you or select for you in the matter is like letting the milkman make you a milk formula for a case of infantile marasmus. The preparations I have prescribed are those of a New York wholesaler who specializes in internal secretions. The drugstore men like to call my formula "thyroid comp."; but the remedy is not to be given in a loose fashion; the amounts of the various ingredients are to be varied with the apparent needs of each patient. Cases without special features may be put at once upon a tablet consisting of ½ grain each of the four glands mentioned above, the tablet being repeated three times a day —after meals. Where the mental dullness is unusually great, systolic blood pressure less than sixty, skin very rough, and the teeth slow and irregular in appearance, the quantity of thyroid should be increased. If the testes are very small and soft (which sometimes happens), the amount of testis in the formula may also be increased.

The best effects are to be had from small doses continued over a long period of time. There are some parents who expect you to cure the backwardness of their child in a week; if you have not completed the task by that time, they go to another physician; such persons should not be encouraged to begin the treatment at all.

Results are better when treatment begins before the end of the second year; but cases started at four and five years have done well, and I recommend it without conditions in all Mongol children under ten years. As to contra-indications, there are almost none. Pineal and pituitary in the doses mentioned seem never to make any trouble. If the child seems nervous, sleeps badly, and cries more than usual during the treatment the thyroid or testis is more likely at fault. In such an event one need only cut the tablet into halves or quarters, and keep on with a diminished dosage.

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IDIOCY

In view of the otherwise entirely hopeless mental prognosis in this disease, I can conscientiously recommend a trial of this method of treatment, and can predict a measure of improvement (sometimes a large measure of improvement) in a large percentage of the cases.

Med.

INFANTS' NUTRITION

Treatment of Nurslings' Intolerance for Milk by Subcutaneous Injection of Milk. (Traitement de l'intolérance du nourrisson pour le lait par l'injection sous-cutanée de lait.) Dr. E. Weil. Presse méd., Paris, No. 60, 601-604.

Many infants present digestive troubles (vomiting, diarrhea, constipation) and nervous disturbances (crying, insomnia, a tendency to convulsions) without any congenital or infectious lesion of the digestive tract, and with a certain degree of health. These symptoms exist from birth or appear a few days afterwards. The most rigid hygiene and the most careful feeding will not prevent them. They appear in breast-fed children as well as in infants fed on cow's milk. Dr. W. cured a great number of such cases by subcutaneous injection of the milk on which the children were fed. Usually only one injection of 10 c.c. of milk was necessary to remove the digestive trouble. Dr. W. considers these disturbances an anaphylactic process. This anaphylaxis is prevented by a sort of vaccination produced by the subcutaneous injection of a small quantity of the offending milk.

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INFECTIONS

Treatment of Surgical Infections by Intravenous Injections of Colloid Gold. (Le traitement des infections chirurgicales par les injections intraveneuses d'or colloidal.) Dr. C. David. Gazette d. hôp. civ. et mil., Paris, No. 50, 784-786.

The author has used intravenous injections of colloid gold in surgical infections with great success. The injection is made into a vein of the elbow-joint. After disinfection of the skin with tinct. of iodine a rubber band is tightly applied above the point of injection. A vein is punctured with the needle of a Pravaz syringe. The flow of blood shows that the needle has well entered the vein. The syringe containing the solution is then attached to the needle and the contents are slowly injected. The dose varies from 1 to 6 c.c., but it is best to commence with a small dose (1 or 2 c.c.). The injections should be made every day until the fever has entirely disappeared. Frequently the temperature falls to normal after the first injection, but in such cases the injections should be continued in order to prevent a relapse. It takes rarely more than eight days for a complete cure. An hour or two after the injection the patient is attacked by severe chills comparable to a malarial attack. But this symptom is without any danger and is soon followed by abundant sweating. On the following day the temperature sinks rapidly and the general condition of the patient is greatly improved.

The author states that in cases of surgical infection which call for an operation the latter should be performed before making use of the injections. If an abscess is to be opened, a bone to be trephined, etc., the operation should first be carried out, but if the infection persists or is aggravated the injections of colloid gold will bring rapid improvement. Colloid gold injections are especially indicated in septicemia, but serious infections are equally benefitted by

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them. Dr. D. has by this method treated a great number of cases of abscess, anthrax, acute osteomyelitis, acute arthritis, phlebitis, purulent pleurisy, etc. His view is that colloid gold exerts an antiseptic action and directly destroys pathogenic bacteria.

Med.

INFECTIONS, FOCAL

Dr. Thomas D. Coleman. Southern Medical Journal.

Infection may be defined as the invasion of the living by pathogenic micro-organisms, which by their life processes produce perversion of function. Focal infection as generally understood and accepted, means the invasion, and in consequence, perversion of function of some organ or organs more or less removed from the focus of infection. The phraseology is catchy, because it invites one to reason from cause to effect, but is not altogether satisfying, since etymologically, the word focus means literally a point, or sharply circumscribed area, whereas the focus in some cases of infection may extend over wide areas, e. g., the bronchial tree, the intestinal canal, genito-urinary tract, etc.

Less objectionable would seem to be the term autoinfection, meaning thereby an infection of the living body by pathogenic organisms within itself; and yet in narrow limits, similar objections might be urged. Focal infection is not a new conception. In the first century it found expression in these words: "If thine eye offend thee pluck it out and cast it from thee." The principle has long been recognized, but in relatively recent years we are indebted to medical workers for calling attention to the fact of focal infection and its role in the production of disease. It is not the purpose of this paper to mention the tissues that are liable to focal infection, for this would involve a description of the entire human anatomy, nor to describe

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the micro-organisms concerned in such processes, for it would entail a dissertation on bacteriology; but I would feel myself derelict to my medical ideals if I did not call attention to certain extremes, not to say errors, that inevitably follow the exposition of facts presented in a new light. Discoveries of a serviceable nature to mankind when freshly made, or reproduced and presented plausibly, are apt to lead to fads, and fads lead to extremes of thought and action.

It is as natural for medical men to follow fads as it is for the human race to follow any "will o' the wisp" that promises relief from the ills that flesh is heir to. To speak not at random, fads often lead the honest man unconsciously into error. They are the food and drink of the shallowpated and the charlatan. They are utilized by the wise. All fads have a modicum of merit to account for their existence. Men of science strive to winnow out the wheat from the chaff. The evolution of an idea like the evolution of a species, is apt at times to produce sports and monstrosities, so one need not expect that medicine can escape these tendencies. The main thing is not to ignore but to profit by them.

A notion of focal infection is as old as the human race. The role which bacteria play in the tragedy was unappreciated until the days of Pasteur and Lister. A retrospection at this time and in this connection will, I am sure, be well worth the moment's consideration. It is within comparatively recent years that the ovary attracted the needlessly assiduous and sometimes rude attention of the surgeon. It was regarded as being the source of a host of woman's ills, complaints or idiosyncrasies. That it is the cause of many of their ills cannot be disputed. Diseases real and imaginary were attributed to the always fecund, but sometimes innocent, ovary. It became a matter of distinction to have had one's ovaries removed, and discussion of it even with one of the opposite sex was not taboo. In this, if I may be

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pardoned the diversion, the bar sinister of the sex is established; one could not even in imagination picture a bunch of men glorying over their own enucleation; but such is the nature of women. In the last public utterance which I was privileged to hear from the late Abraham Jacobi, he said to a body of my students: "I was recently in the office of a surgeon and he showed me with great pride a jar filled with ovaries that he had removed. Instead of praising him as he had expected, I told him I knew a better place for ovaries than glass jars." This sums up what it took many years to learn. It is not now regarded as the mark of a good surgeon to cut out an ovary, but rather to cut out only that which is diseased and leave the rest of the organ for the normal uses that nature intended. Another organ to go under the ban in the fight against focal infection was the appendix vermiformis, and so violent was this onslaught that it was said jestingly at one time that people in the larger centers were having stamped on their underclothing "mine has been removed," so that if they were found unconscious they might not be operated on a second or third time. "An inch and a half incision and a week and a half in bed" has passed into a proverb; it was enunciated first, I believe, by one of the great geniuses of modern surgery, to whom we are all debtors, and yet one can but be impressed by the relative infrequency of appendix operations now compared with a decade ago. Except in fulminating cases Oxner's dictum paraphrased, of watchful waiting, I believe, is now adhered to, although some surgeons still stand for immediate removal.

Then followed the fad of removing tonsils and adenoids. Many of the generation of men had had tonsilitis, and lived to tell the tale, but it devolved upon the focal fad followers, if I may so style them, to propagate the dictum that all enlarged tonsils must be immediately removed root and branch; and with this idea very radical operations

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are being performed even unto this day. It was held that the tonsils were not only useless, but were the atria of entrance into the body for germs; that many, if not most, of the bacteria that lurked in the air found entrance into the body through the tonsils; and that those which they could not admit immediately into the blood stream they held in captivity until some convenient time when they could do so. As a result large numbers of full grown tonsils, many adolescent ones, some even infantile ones, were removed. Some patients were benefited; disappointment was the lot of others. In the hands of conservative men it is, I believe, the practice now, to remove only such tonsils as are manifestly diseased, or which hold in their structure infectious organisms.

The present fad extends several years back, and expresses itself in war on the teeth—shall I say to the teeth? And so teeth are coming out of the mouths of people like corn out of a hopper, and dentists are everywhere apparently unequal to the demands upon them. I fear the fad is making a generation of toothless young people, and one horror of old age is anticipated. Artificial teeth are not the equal of those furnished by nature, and I am persuaded that many of the latter are being unwisely sacrificed, which could be preserved by appropriate treatment in situ. It is not the work of a good dentist to pull teeth, but to save them, and I believe that conservation will yet assert itself; the pendulum will swing back and only teeth will be removed which cannot be saved or which are causing demonstrated systemic infection.

Even the colon with its expanse of surface has not escaped attention, and colons have been removed in whole or in part, with doubtful benefit, and sometimes grievous harm to their possessors, in the hope of relieving focal infection-intestinal stasis, etc. As previously stated, these extremes of practice should not lead to the denial of the theory

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of focal infection, for in the light of present knowledge it would make one ridiculous; nor should one too readily condemn wholesale those who in their enthusiasm advise and employ operative procedures of such nature. One should be impressed, however, with the serious necessity of careful study of all the premises before deciding that a given organ is the source of systemic disturbance and should be removed. Such organs as the ovaries, the appendix, the tonsil, and the teeth are not placed in the body for purely cosmetic reasons.

How often has it occurred within the experience of medical practice that the ovaries when removed, as they were e. g., in Battey's operation, did not improve the nervous phenomena from which the patient suffered; that the extirpated appendix showed no evidence of infection, gross or microscopic; that removal of the tonsils and the teeth had no effect whatever on the arthritis, myositis or pancorditis from which the patient may have been suffering and that in the language of the scriptures, "Verily the last end of that man was worse than the first."

How often does one not find that patients with badly diseased tonsils, alveolar abscesses, and sinus disease, present no evidence whatever of general or systemic infection.

It goes without saying that where an organ is diseased to an extent that it is a menace to the body, if it does not entail too great danger to other and more important tissues, it ought to be eradicated. "Ubi pus ibi evacua" may not be classical Latin, but it is an axiom sound and true, but it also should be borne in mind, that often even pathogenic organisms remain strictly localized, and produce no systemic effect; and that, in the process of removing these foci, openings into the blood stream or lymphatics may be made which lead to general infection, the very thing which one wishes to shun. Numbers of such cases have been reported. Unstinted praise should be given

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to the pioneers in this field who have so enriched our knowledge of focal infection; to such workers as Winge, Rosenow, Billings, Pointon, Paine, and a host of others for giving a rational basis for systemic infection resulting from focal lesions, our debt is great; but the value of their work and the allurement of their theories may, when pushed too far, lead to excesses in treatment. The fact that a patient has a circumscribed abscess at the root of one tooth does not keep him from having a cholecystitis, or open pulmonary abscess that may be accounting for his systemic symptoms; under such circumstances all the teeth might be extracted and the patient be not a whit relieved. And while it is true that many acute and chronic infections which may be general, may and often do, start from infections true that the alimentary canal is a source of infection with its twenty in the mouth, nose, ear, sinuses, and genito-urinary tract, it is also feet or more of gut; much more frequently than is commonly appreciated.

In making a diagnosis of focal infection, and by this I mean systemic infection from some focus or foci, it is needful to employ every means of diagnosis—clinical, bio-chemical, bacteriological and radio-graphic. Even when all these are exhausted, one may fail.

It is not only necessary to determine that the systemic infection is due to an infective focus and secondly to locate that focus; but often a focus which seems potentially capable of spreading systemic infection is innocent or innocuous, and some focus far removed and unsuspected is producing the trouble.

Bodily or systemic infection is effected through the medium of the blood and lymphatics, micro-organisms attack with frequency endothelial membranes which seem to possess small resistance to invading bacteria. This is shown by the frequency of involvement of the endocardium, pericardium, synovial covering of joints, perito-

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neum, pleura, meninges, and the mucous membranes of the mouth, and accessory passages, the alimentary canal, and the genito-urinary tract. Sometimes it may be by extension, simply as one sees in erysipelas, and yet toxins are set free which produce systemic disturbance. It is of moment, therefore, if one is to combat effectually the process that not only the primary but also the secondarv foci shall be discovered.

When a focus of infection is established, it may remain innocuous to the body in general, e. g., in an encysted tuberculous nodule or a furuncle in the subcutaneous tissues. A few organisms may at times escape the barriers, but they are destroyed by the phagocytes or the inimical plasma. When they escape in larger numbers or their virulence is intensified, or the defensive processes of the tissues is impaired, general infection ensues.

Conclusions

(1) The fact of focal infection is not disputed.

(2) Focal infection is caused by pyogenic organisms that are distributed through the body by means of the blood and lymph streams.

(3) Foci of infection when removable should be removed, but removal should be a treatment and not a diagnostic procedure.

Med.

INFLUENZA

The Value of Antistreptococcus Serum in Influenza. Dr. W. Hughes. Lancet, London, 783-785.

Sixteen cases of influenza in the early stages of the disease were treated with antistreptococcus serum injected subcutaneously into the back below the scapula. The initial dose given was 10 c.c. repeated

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every twenty-four hours if the temperature was still up. In most cases there was a fall of temperature to normal and rapid recovery after one or two injections. In no case was more than 40 c.c. required. All cases made a rapid recovery and never developed pneumonia or prolonged bronchial trouble.

Med.

INFLUENZA

Contribution to the Treatment of Influenza in Adults and Children with Injections of Camphorated Oil and Guaiacol. (Contributo alla cura della influenza negli adulti e nei bambini con le iniezioni di olio canforato al guaiacolo.) Dr. C. Bassoni, Policlinico. Roma, sez. prat., No. 15, 449-452.

The author has treated a great number of cases of influenza with injections of camphorated oil with guaiacol. The dose for adults is 2 c.c. of 10 per cent. camphorated oil combined with 10 c.c. of guaiacol; for children he uses half this quantity. Two to three injections are administered daily. This treatment has proved successful in the most serious cases, and the author considers it the most efficacious treatment, superior to any other method of treatment known so far.

Med.

INFLUENZA

The Methylene-Blue Reaction of the Urine of Influenza Patients. (La bleumetile-reazione nelle urine degli ammalati di influenza.) Prof. Aradas. Riforma medica, Napoli, No. 11, 213.

The urine of influenza patients is always cloudy and produces an abundant reddish sediment due to the presence of large amounts of uric acid and urates. Frequently it contains also a variable quantity of albumen and cylindrical casts. The urine of such patients

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is always scanty and sometimes there is complete anuria for twenty-four hours. Prof. Aradas found the methylene-blue reaction positive in all cases and it proved an unfailable diagnostic procedure.

The methylene-blue reaction is carried out as follows: A test tube is filled with 6 c.c. of water, another with the same quantity of urine. By means of a dropper five drops of the reagent are passed into the tube containing water, which, on shaking, assumes a beautiful azure color. The same amount of the reagent is then passed into the tube containing the urine. If it is urine of an influenza patient it assumes instantly a clear and beautiful green color which gradually changes from grass green to bottle green if the test is positive; if it is negative, the two tubes show the same color.

Med.

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United States Bureau of Research. Report to Louisiana State Board of Health. By L. C. Scott, Ph. D., M. D.

No effort has been made to consider the Influenza from all angles; only those points which can be considered of paramount interest have been treated. These are the Etiology, the Therapeutics, and Prophylaxis.

Such subjects as Symptoms, and Pathological Anatomy have not received attention, except where pertinent to one or the other of the three main headings.

Points of noteworthy importance are: first, the uniformity of opinion as to the cause and findings in influenzal pneumonia; second, the lack of uniformity as to the role that the influenza bacillus plays; third, the disagreement on the question of face masks; fourth, the value of vaccination, whether as a prophylactic measure, or as a part of the therapeutics; and fifth, the various and often unique methods of medical treatment.

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The work of each authority is presented as it occurred, without any attempt to blend them into a complete whole. To do this would occupy far too much time, and would result in the loss of individual opinion which, though of apparently small importance, at least deserves attention.

General Considerations

In the early English literature, Creighton says that influenza was spoken of as the "ague," and it is said that Cromwell died of the disease in 1658.

The term "influenza" was introduced by the Italians, and the disease became known as such during the epidemic of 1743. In 1712 the French invented the word "la Grippe" for an infectious disease, which presented the clinical symptoms of the Italian influenza.

The first epidemic is said to have occurred in America in 1647, while others prevailed during the years 1789 and 1807.

Pandemics, or at least very extensive epidemics, occurred in England in 1803, 1833, 1837, 1847, 1875, and of course in 1890, according to a memorandum of the College of Physicians of London. They consider that of 1918 identical with the preceding one in 1890. Thus Connor, after reviewing the symptomatology and complications of influenza during the present epidemic, points out the identity with that of the one which occurred in 1889 and 1890, the only difference being in the greater incidence, the increased virulence, and the comparative absence of the cerebro and gastro-intestinal types. To all intents and purposes this had a respiratory localization almost entirely.

With regard to the pandemic just passed, the origin is attributed to Spain, though it is doubtful whether it was first seen in Spain or in the United States. Early in the spring of 1918 a disease of short

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duration actually did occur in Spain. It certainly prevailed in March in the United States according to Opie et al., and was reported from Camp Oglethorpe in March '18. About the same time it occurred among the military and civilian population of France and England. Twenty-five per cent. of the population were affected. The first cases occurred in Germany following an engagement with American troops presumably infected, in July.

The first report that a serious epidemic existed came from Camp Devens at Ayer, Mass., September 16, and is said to have commenced September 7, 1918.

Soper states that the first true and serious epidemic occurring in America was brought by shipping from foreign ports. In this respect it is worth noting that the troopship Manchuria arrived at New York February 22, 1918, there having been 168 cases and four deaths from influenza on board. Nothing, however, appears to have developed at this time, but later the bearing of shipping on the spread of influenza seems to have acquired greater significance. This appears to have been the case from June on through July and August, according to reports. The Exeter of Liverpool came to Philadelphia on June 22 with twenty-seven Lascars and a quartermaster ill with pneumonia. On July 7 the papers report the Cunard Liner Khiva putting back into port on account of the number of cases on board. Outbreaks of influenza occurred on the Rochambeau and Nieuw Amsterdam, according to New York papers around August 18. The Bergensfjord arrived at New York August 12 with 200 cases of influenza on board. This report, which Soper claims is not complete, serves to show that influenza was brought to the United States throughout the summer of 1918, and according to him the patients were allowed to go ashore and mingling with the population "scattered the sparks from which the pandemic probably arose." During

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the period from September 12 to November 1, 1918, there were 306,719 cases of influenza among troops. There were 48,079 cases of pneumonia, and 19,429 deaths. In the forty-five principal cities from which statistics were available at the time the author wrote, 3.24 per 1,000 were reported to have died, there were 127,654 deaths from all causes and had there been no influenza it is estimated there would have been 47,967 deaths in these cities. The difference, therefore, due to the pandemic, is 79,687. In the whole United States, estimating the same prevalence and rate, there would have been 341,021 deaths among the civil population plus the 19,429 in camps, which brings the total deaths to 360,450.

Loomis and Walsh report the spread in a hospital from a case of influenzal pneumonia received from a troop train. The patient was immediately placed in strict isolation, and all precautions, especially the use of a face mask, were taken. The following infections resulted: Chief of Laboratory who took blood, developed pneumonia and died, Medical and Surgical Chiefs both were infected, and the nurse attending the patient on the fourth day. Other nurses and attendants, and eighteen enlisted men contracted the disease. Altogether twenty-eight cases developed among a personnel of 100. It is said the original patient was an extremely malignant case of influenza, and the necropsy revealed a broncho-pneumonia involving the whole left and 50 per cent. of the right lower lobe.

Based on incomplete statistics, Frost estimates that there were no less than 450,000 deaths attributable to influenza during the last epidemic. This represents about forty per thousand. This ratio of deaths to population ranged from 1.9 in Spartanburg to 6.8 in Maryland towns. The case fatality from influenzal pneumonia ranged from 18.5 to 80 per cent. The death rate was very high in children under one year, in adults between 20 and 40 and in persons over 60 years.

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Influenza in Foreign Countries

According to A. F. Coutant, influenza first made its appearance in Manila in June, 1918, among laborers and longshoremen on the docks. It was brought in all probability by an army transport from San Francisco. This transport had thirty cases on board, with one death. The disease spread rapidly from the docks, and while the usual symptoms were present, nausea, vomiting, and hemorrhages were pronounced. With the coming of the typhoon the epidemic ceased. There was a 2 per cent. mortality with lung involvement symptoms.

Japan seems to have been visited by influenza during the spring of 1918, and this became part of the great pandemic during the next October.

The influenza reached the city of Buenos Aires when the Demerara and Infanta Isabel, two ships with numerous cases of influenza on board, arrived, occurring soon after allowing passengers to go ashore. In three weeks there were 250,000 cases in Buenos Aires, but with the exception of a few cases in the hospital, there were no deaths. B. Influenzae is said to have been found in most cases.

In Rome, during the summer of 1918, the epidemic was so light as not to necessitate closing the schools.

The respiratory affection while often associated with the influenza bacillus was, however, largely dependent on the secondary invasion with pneumococci, streptococci, and in some instances meningococcus.

Pisquez reports 75 per cent. of 100,000 persons in Caracas were infected, with a death rate of 1.4 to 1.9 per cent. He believes that immunity was conferred by an attack. There were many relapses in those who left the bed before the 3d, 4th, or 5th day after the disease. A chill served to bring about a relapse.

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A third wave of influenza seems to have swept over England, though the decrease in the rapidly fatal and septic types of pneumonia following it, seems to indicate that in comparison with the summer and autumn epidemics the virulence was much lessened. Some immunity seems to have been established, those affected previously not acquiring the infection in such a large proportion of cases.

In South Africa the epidemic caused the death of 11,736 Europeans, and 127,000 colored population within two months.

Statements are to the effect that influenza was responsible for a death roll of approximately 5,000,000 in British India and that probably 1,000,000 died in the native states from this disease. These statistics may or may not amount to much, except as an expression of the ravages of the disease.

The Etiology of Influenza

So much controversy has raged over the etiology of influenza that it is difficult to know just where to begin to record the numerous and often conflicting data. It would seem that the most rational conception can be obtained by first reviewing the findings of investigators during previous pandemics and epidemics, and then passing on to the actual observations made in the one which swept the world in the latter part of 1918.

An excellent epitome of the early literature pertaining to the bacteriology of previous epidemics is given by Kinsella and will be cited in so far as it bears on the present case.

As early as 1890 Strumpell noted both a lobular and a diffuse broncho-pneumonia as a complication following influenza; Ribbert noted streptococci very often, and Marmorek, Weichselbaum, Kirchner, and Babes found pneumococci as accompanying organisms, while Levi found streptococci, pneumococci and staphylococci associated

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in the lesions. It was not, however, until Pfeiffer, after studying a number of cases clinically the same as those occurring during the epidemic of 1889-90, succeeded in isolating and cultivating a small, gram-negative bacillus from bronchial secretions, which he looked upon as the causative organism of influenza. He also succeeded in demonstrating its presence in the pus of pulmonary lesions.

Weichselbaum, in 1892, substantiated the findings of Pfeiffer, as also did Grassberger, in 1897, and others; in fact, practically the whole medical world except the French accepted Pfeiffer's bacillus as the etiological factor in influenza.

Later, however, in 1901, Leiner and Susswein in Germany found the Pfeiffer bacillus in other diseases of the respiratory tract. Wynekoop and Auerbach, in 1903 and 1904, confirmed these observations, so that it finally came to be known that besides in influenza, the so-called influenza bacillus was found to be present in conjunctivitis, purulent bronchitis, diphtheria, scarlet fever, sore throat, etc. Wollstein, in 1906, and Davis, in 1907, also found the bacillus not only in the diseases already mentioned, but also in many cases of bronchopneumonia, tuberculosis, and whooping cough. In this infectious disease Davis found the bacillus in sixty-one out of sixty-eight cases. Lord, who examined 186 cases of respiratory infection, found the influenza bacillus in 25 per cent. of all cases. In a later article Lord and his co-workers cite Cole and McCallum as having found influenza bacilli in thirteen out of seventeen cases (76 per cent.) of bronchopneumonia following measles, and they (Lord et al.) also give a table by other workers, in which influenza bacilli are shown to be present in tuberculosis in 33 per cent., in measles 78 per cent., in the nose or bronchial secretions 33 per cent., in the throat and sputum 56 per cent., in scarlet fever 39 per cent., in diphtheria 60 per cent., and in varicella in 100 per cent. of the cases examined. Thus it will be seen,

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that from the start there prevailed in some sections a decidedly skeptical attitude toward the role which Pfeiffer had ascribed to his bacillus, though, as will be seen later, there are still many who are by no means convinced that it is not the cause.

The Bacteriological Findings

Among the first to send in definite bacteriological observations during the epidemic was J. J. Keegan. He claims to have had 2,000 cases in the First Naval District Hospital in the two weeks, August 28-September 11. His findings were the micrococcus catarrhalis, a diplococcus (pleomorphic and gram-positive), streptococcus hemolyticus, and the influenza bacillus. No results were conclusive in sputum smears. Lung punctures gave pure or mixed cultures of influenza bacilli in 82.6 per cent. of twenty-three cases. In four cases streptococcus hemolyticus was encountered, in thirteen the pneumococcus.

Friedlander and his associates at Camp Sherman could not find B. influenzae, but pneumococci Type IV and hemolytic streptococci were found in the sputums and necropsies most frequently.

During the recent epidemic of respiratory diseases at Camp Custer, Michigan, Blanton and Irons found that in the pneumonia cases, 2 per cent. of 510 blood cultures showed a bacteriemia with hemolyzing streptococcus. In 749 pneumonia sputums, 451 showed streptococci, 30 per cent. of which were hemolytic, and 70 per cent. non-hemolytic. Type IV was the pneumococcus usually found (148 times). The influenza bacillus was identified thirty-eight times.

The authors conclude that the patients are attacked by a severe acute infection of unknown etiology, with the production of a purulent bronchitis, pains, temperature, and prostration. The peribronchial tissue is involved by direct extension, pulmonary congestion and

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consolidation with edema supervenes, which either terminates fatally or resolves. Leucopenia indicates an overpowering of the defensive forces. The influenza bacilli play but a minor role. The infective cause of the antecedent respiratory infection remains unknown.

The records indicate that the pneumonia which accompanied the influenza was not broncho, but lobar pneumonia. The mortality rate was 14-20 per cent. The authors draw the conclusion that it is possible that influenza in a greater or less degree acts as a predisposing factor in pneumonia.

Examination of mouths of healthy men in the Camp for pneumococci showed the presence of a typical Type II, and Types III and IV in 61.2 per cent. of those examined. Type I was found only twice. The Avery method of identification was used. Hemolytic streptococci played but an insignificant part in the production of pneumonia and its complications. They were found in the mouths of one in four or five healthy men at Camp Funston, and in 35.1 per cent. of the men examined B. influenzae was found. It was associated with pneumococci in eight out of sixty-two cases of pneumonia.

In the broncho-pneumonia cases the sputum contained pneumococcus Type I, no times; II once, (23.3 per cent.); II (atypical), three times (7 per cent.); III three times (7 per cent.); IV thirty times (69.8 per cent.). Streptococcus hemolyticus occurred six times (14 per cent.), twice with Type IV, and four times without pneumococci. B. influenzae occurred thirty-eight times (88.4 per cent.), both with pneumococci, and with streptococcus hemolyticus.

The authors conclude that influenzal pneumonia follows a lesion with B. influenzae, making the invasion of the mucosa and the tissues by the pneumococci (in this case for the most part Type IV), and by the streptococci a possibility. It is not improbable that bronchi previously infected with B. influenzae pave the way for a broncho-pneumonia with streptococcus hemolyticus alone.

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The authors believe that streptococcus pneumonia enters the ward through persons harboring these micro-organisms in their throats, and that overcrowding, failure to separate the patients, indifferent asepsis, favor the spread. This holds equally as well for pneumococcus infection. They believe that patients, convalescents from a pneumonia caused by one type of this organism, may be infected by another type and succumb.

During the epidemic at Camp Cody, which began October 1 and lasted until December 1, there were 8,265 cases, 624 or 19 per cent. developing pneumonia, with a death rate of the total of 7.3 per cent., or 38.4 per cent. of those developing pneumonia.

Stone and Swift conclude from their findings at Fort Riley, that while the B. influenzae had not been previously noted to any great extent in throat cultures of patients during the year preceding the outbreak of influenza, it played, or an unknown virus played, a distinct part in the epidemic. Pneumococci and the hemolytic streptococci, however, were responsible for the pulmonary symptoms and deaths.

In the cases which Lord and his co-workers examined, they found influenza bacilli in sputum preparations in thirty-two out of thirty-eight cases (84 per cent.). In cultures they obtained positive results in 78 per cent. of the cultures from sputum. Micrococcus catarrhalis, and pneumococci together with streptococci of the hemolytic and non-hemolytic type, were present.

The authors conclude that the influenza bacillus is part of the flora of the normal respiratory tract, and they succeeded in finding it in 76 per cent. of the normal individuals examined during the epidemic, and in overwhelming numbers in 19 per cent. of the cases. They believed that the human organism is necessary for its propagation, and that it cannot exist outside the body. They were not able

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to confirm Pfeiffer's findings made during the epidemic of 1893, in which he found it present in overwhelming numbers in all cases. In spite of their results they believe that while the bacillus may contribute to the pathology of the disease, it must be regarded as a secondary invader.

Dever, Case, and Boles, working at the U. S. Naval Station, League Island, Pa., made one hundred and five cultures from sputum, thirty-five from the naso-pharynx, eleven from the laryngeal region, and eleven from the eyes. They used 0.5 broth and agar to which blood, either human or from the rabbit, had been added. B. influenzae was isolated in pure culture four times, though organisms resembling it were obtained in the sputum of twenty cases. Stained smears of sputum revealed organisms resembling the Pfeiffer bacillus in a good percentage of cases. Pneumococci, streptococci, principally of the non-hemolytic type, and M. catarrhalis were commonly found.

Of forty-two pneumonia cases studied, the pneumococcus of Types I-IV prevailed thirty times. In the remaining twelve cases the bacteria present were found to be streptococci and few pneumococci.

In the initial infection B. influenzae, pneumococci, and streptococci were found. These authors believe that the initial infection is still unknown and that the secondary lobar pneumonia was due to pneumococci and streptococci, while the broncho-pneumonias were caused by the Pfeiffer bacillus.

The observations of Lyon and his co-workers at Camp Upton were, for the most part, made during the period of primary invasion extending from September 13 to October 22, 1918. During this time there was an admission of 6,131 cases of influenza to the Base Hospital. No organisms, aside from the streptococcus hemolyticus, were isolated from the throats which could be in any way regarded

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as the primary infecting agent, and this organism was not constant. A secondary epidemic, with a lower mortality rate, extended to December 1. The mortality for the first epidemic was 6.58 per cent., for the second, 4.18 per cent., for the whole period, 6.30 per cent. Of those attacked with pneumonia, an average of 28.7 per cent. died.

Lyons' work at the Walter Reed General Hospital on the gross pathology of influenza showed it to be a disease which primarily attacked the respiratory tract. The only locations in which the Pfeiffer bacillus was found was the lungs, bronchi and trachea. It was never found to the exclusion of all other organisms, although late in the epidemic it was obtained frequently by lung puncture. Lyons' observations were made in conjunction with those of Nichols and Stummel, by whom Friedlander bacilli were found in a case of pneumonia which came to necropsy, the lung juice of which killed twenty-seven out of thirty guinea pigs within twenty-four to forty-eight hours. They were proven to be present in smears made from the lung along with pneumococci and streptococci. The organisms in pure culture produced the typical mucoid growth on agar. A point made is, that without the capsule stain, these organisms may be taken for influenza bacilli on account of their small size and gram-negative staining characteristics.

Lamb noted that the mortality rate of post influenzal pneumonia was nearly three and one-half times that of primary pneumonia. Pneumococci Types I and II occurred in 41.1 per cent. of the sputa of primary pneumonias, and in only 4.6 per cent. of the influenzal complications. Types II and III were found to be about equal, while Type IV was found in only 14.1 per cent. of the primary pneumonias and in 46.5 per cent. of the influenza cases.

Wollstein and Goldbloom found the influenza bacillus in eighteen necropsies of children dying of pulmonary complications following

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influenza. Pneumococcus Type IV was the most frequent micro-organism accompanying the influenza bacilli. During life the influenza bacillus was found in thirteen out of seventeen cases in which it was searched for. The mortality among thirty-six cases was twenty-four or 66.6 per cent.

The opinions of the members of the American Public Health Association are embodied partly in the Committee Report, and partly in the Society Proceedings. As to the nature of the epidemic the Committee concluded—"that micro-organism or virus primarily responsible for this disease has not been identified" (this was December 9-12, 1918). Laboratory methods, they say, were of no avail in distinguishing between influenza and other infections, such as colds, bronchitis and other inflammations of the air passages.

In the Hygiene Society of Japan, Ishiwara demonstrated influenza bacilli in 45-69 per cent. of influenza cases, and in from 35 to 55 per cent. of measles, scarlet fever, and diphtheria. He did not believe the influenza bacillus was the cause.

A digest of the "Medical Supplement," published monthly by the British War Office, containing observations on influenza in Germany, shows that the general results have been about the same as those obtained in this country.

Is the Influenza Bacillus the Primary Cause?

More or less dogmatic assertions regarding the part which the influenza bacillus played in the epidemic have appeared in the literature from time to time. Some of these have been quoted in conjunction with the bacteriological findings already presented. Others which lay special stress, one way or another, on Pfeiffer's bacillus and its etiological significance, will now be given.

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Thus Rucker and Werner feel they are justified in saying that B. influenzae is the primary etiologic factor in the production of influenza, and that the secondary pneumonia and fatal terminations are due to the production of broncho-pneumonia by B. mucosus capsulatus, and not by B. influenzae. Furthermore, they do not believe that B. pestis was a factor in the recent epidemic.

On the other hand, the agreement of a meeting to consider influenza held in London under the direction of Leishman, was to the effect that B. influenzae was not of etiologic significance, but that no doubt it played a part in producing the primary symptoms and complications. Associated organisms responsible for pneumonic complications, were the pneumococci and streptococci.

At a meeting of the American Public Health Association, Davis remarked that, while reports of the present epidemic gave a very large percentage of positive findings of the influenza bacillus in lung punctures, and post-mortem material, he points to the fact that Pfeiffer himself was not able to find it with any degree of constancy, and that while German and Swiss authorities lay stress on a diplostreptococcus, England leans to the possibility of the Pfeiffer bacillus as the etiological agent.

He believes we are justified in assuming that the influenza bacillus was not the cause of the epidemic; first, because it has regularly been found in other diseases which are clinical entities with entirely different symptoms (he mentions measles, pertussis, and rheumatism as examples); second, animal inoculation has been negative; third, the influenza bacillus is a diplococcus, and moreover it produces a leucocytosis, while leucopenia predominates in this epidemic; fourth, prophylaxis with influenza bacillus vaccines has been worthless; fifth, according to its prevalence, rheumatism, measles, and pertussis, could equally as well be caused by Pfeiffer's bacillus as influenza; sixth, the

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diplostreptococcus has as much right to be regarded as the cause as the influenza bacillus. Ribbert, he claims, considered the diplostreptococcus as the cause in 1889-1890, and Mathers and Nuzum in this country have also found it.

That the B. influenzae may be the cause of an endocarditis following a broncho-pneumonia in which the B. influenzae predominated, has been shown by Malloch and Rea who found it in the aortic and mitral vegetations in pure culture.

Park concludes that "there is no proof that any one germ is present in all cases. The influenza bacillus has the lead among the possibilities . . . . the thought remains in the minds of many that the failure to obtain it in some outbreaks is due, not to its absence, but to lack of training in the bacteriologist seeking it." He gives the proportion of findings by Williams among 278 cases thus: In hospital cases the influenza bacillus was found in 80 per cent., in Marines in 100 per cent., at the Home for Children in 98 per cent., in lungs in 80 per cent., in the trachea in 96 per cent., and in the heart's blood in 10 per cent.

Jordan has found the influenza bacillus in 64 per cent. of the cases, the pneumococcus in 20 per cent., and others such as Friedlander, an unidentified gram-negative diplococcus, staphylococcus, were also frequently found. A diplococcus, or streptococcus, found by Mathers at Camp Meade, was of almost as frequent occurrence as the Pfeiffer bacillus. He concedes that the influenza bacillus has been more conspicuous than any other organism.

An editorial in the American Medical Journal in the latter part of 1918, which sums up the findings both of the British and German investigators, expresses the belief that—"The bacteriologic results do not appear to warrant the assignment of any greater importance to the influenza bacillus than to organisms described as diplostrep-

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tococci." These diplostreptococci are not described fully, but they are most probably non-hemolytic, of the viridans type. Only slight mention is made of hemolytic streptococci, or of pneumococci, which appear to be isolated in a certain proportion of cases in this country.

According to the published conclusions of the Kitasato Institute, the cause of the 1918 pandemic was the Pfeiffer bacillus, and while the Japanese investigators admit its presence in the nasal cavities of normal persons, they say it does not predominate to the extent that it does in influenza.

Yanagisawa believes from his research that the influenza bacillus which the Kitasato Institute has recognized as the cause of the epidemic, first invades the mucous membrane, causing characteristic symptoms, and that the symbiosis with other organisms intensifies the toxic action of the latter, and leads to the secondary symptoms which overshadow those caused by the influenza bacilli, and the latter may be entirely overwhelmed.

The Role of the Streptococci

A great deal of attention has been directed to the part which some members of the streptococcus group are supposed to have played in the great epidemic, and much effort has been expended in investigating the relationship supposed to exist between the disease and its pulmonary complications.

It will be recalled that most of the observers record with a fair degree of regularity the presence of some one of the streptococci, usually the hemolytic type, both in sputum and in post-mortem material. This observation is not by any means new, streptococci having been repeatedly observed during the epidemic of 1889-90 (Editorial). The questions have, therefore, been raised: Are these organisms which are so constantly found, secondary invaders from an outside

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source, or do they belong to the so-called "normal" flora of the oral cavity? Is their multiplication, increase in virulence, and the invasion of the deep lying tissues due to a breaking down of the protective barriers by some, as yet, undiscovered virus?

The Tonsillar Crypts the Habitat of the Streptococcus

An editorial in the American Medical Journal summarizes the literature of streptococcus infection secondary to some other disease, and the opinion is expressed by the editor that the streptococcus hemolyticus in the tonsillar crypts must be regarded as the cause of secondary infection. In most instances these streptococci are not virulent strains from outside sources, but come from pre-existing foci. They become virulent by symbiosis with other organisms (Pilot and Davis) such as B. diphtheriae, the pneumococcus, influenza bacilli, streptococci, etc. The diminished resistance of the human organism may facilitate their invasion of the tracheal and pulmonary mucosa, and by penetrating the tissues they get into the blood stream. As high as 82 per cent. of healthy men in some of the camps have been shown to harbor hemolytic streptococci, while during measles, and influenza epidemics the incidence has been practically 100 per cent. of all examined.

Just before an outbreak of respiratory infection at Camp Custer in 1918, Blanton and Irons took smears from the nose and naso-pharynx of enlisted men. Of the 357 cultures made, 75 per cent. showed hemolytic streptococci. In uncomplicated influenza (366 cases), they found 34 per cent. infected with the hemolytic streptococcus, non-hemolytic streptococcus in 33 per cent., pneumococci in 12 per cent., influenza bacilli in 8 per cent. All blood cultures taken were sterile.

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In a later report in 1919, Blanton and his co-workers found that 65 per cent. of the deaths from acute infectious diseases coming to necropsy at the same Camp (Custer), were due to streptococcus. They found the throat in 90 per cent. of persons apparently normal, and whose tonsils were examined after exposure to patients ill with a streptococcus infection. They were found only exceptionally in throats from which the tonsils had been removed.

In all cases the streptococcus is to be regarded as a secondary invader. The role of exhaustion and fatigue must also be taken into consideration.

The Staphylococcus

It would appear that in some instances the staphylococci have developed an unusual degree of virulence, and have played no uncertain role in the mortality rate. Thus, for instance, Chickering and Park report that out of 8,100 patients at Camp Jackson, S. C., 1,400 developed either a protracted fever or symptoms of pulmonary involvement. Sputum examination of patients showed pneumococcus, for the most part Type IV, B. influenzae, various types of streptococci, and also M. catarrhalis and M. flavus. Besides this a certain number developed critical symptoms with cyanosis of a peculiar color, which, though they claim is not pathognomonic, is apparently associated with staphylococcus infection. The sputum from this form of pneumonia was of a dirty salmon-pink color, a color resembling anchovy sauce, or an overripe furuncle.

Of 385 deaths among 1,409 cases of pneumonia at Camp Jackson, 153 were found to be associated with staphylococcus aureus in the lung, and the authors believe that in as much as 312 lung cultures were obtained from their 385, there is reason to think that this figure is considerably below the true mortality incidence.

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Miscellaneous Organisms

The presence of a diplostreptococcus has been remarked by a number of observers, both in this country and abroad. However, since its relationship and its morphology are still somewhat problematical, sufficient note of its occurrence, it is believed, has already been made under the general bacteriology. It still remains to discuss those organisms with certain definite characteristics, which investigators seem to think may possibly have some bearing on the etiology of influenza.

In material from thirty influenzal broncho-pneumonia cases Katz found besides B. influenzae (in 15), pneumococci (in 27), a diplococcus (in 14), streptococci (in 8), a short thick bacillus (in 24), the morphology of which resembled B. pestis and which responded to the crucial test of Albrecht and Ghon. He claims that it was highly pathogenic for laboratory animals.

Lee pointed to the difference between the plague pneumonia and the pneumonia following influenza, and to the fact that in the former there were virtually no survivors. Nor, in his experience, had the plague bacillus ever been isolated from the sputum. He said that the identity of the filterable virus claimed to have been isolated in England might, however, prove to be related to the plague bacillus.

At a Pathological Society meeting held in Kyoto, Japan, Katsurado expressed his belief that neither a filterable virus nor the influenza bacillus was the cause of the epidemic. He believed that it was due to a micrococcus.

Plascencia, Professor of Microscopy at the University of Havana, has discovered in the sputum, and in the throats of persons attacked with influenza, a micro-organism, which at first was thought to be Pfeiffer's bacillus, but later found to be motile, to grow on ordinary media, as well as blood agar, and to produce in monkeys a

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typical attack of the disease with sudden high temperature, catarrhal symptoms, and great prostration.

Last of all, a parallel is drawn between the contagious bronchopneumonia, which frequently occurs among horses, and influenza. Undoubtedly there must be quite a marked degree of similarity judging from one correspondent in the Journal American Medical Association, as well as the attention given to this disease in British War Office Digest of German literature.

Is a Filterable Virus the Primary Cause of Influenza?

The many difficulties, and apparent contradictions, which investigators have encountered in making human and animal transmission experiments, have led some of them to the conclusion that an organism which is small enough to pass the pores of Chamberland, or Berkefeld filter, is responsible for influenza.

The first intimation that a filterable virus may produce the disease appears to come from Nicolle and Lebailly. Then Gibson and Connor produced evidence to the same effect by repeating and confirming the work of the two Frenchmen, as also did DaCunha, in Brazil, and Yamanouchi, in Japan.

Betchkov believes that in view of the double fever curve in influenza, two agencies must be made responsible for the disease. The first he considers due to a filterable and inframicroscopic virus, the second, however, he believes due to infection with secondary organisms.

Bradford and Bashford go so far as to claim that they not only have proven the etiological agent of influenza to be a filterable virus, but that they have cultivated it as well. It is said that it may be seen with the microscope in the filtrates and demonstrated by appropriate staining methods. They have also succeeded in increasing its

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virulence by animal passage, and believe that this fact throws light on the severity of later epidemics. They claim that the lungs are not infected from above downward, but that the production of blood clots and dead tissues by the primary organism in the blood stream produces foci in which secondary organisms may localize. The presence in the bile and urine of monkeys indicates that the sputum is not the only means of excretion. The virus is said to have a definite morphology.

Transmission Experiments

The results of human and animal transmission experiments are variable, and the work of some of the experimenters is frequently contradicted by the observations of others. The pioneers in this field appear to be Nicolle and Lebailly, and Dugaric de la Riviere, who succeeded in producing reactions both in man and monkeys with filtrates from sputum of influenza patients. Blood was injected both intravenously and subcutaneously. In the latter there was a reaction, in the former none. Filtered secretion was injected subcutaneously, and produced a reaction in the human experiment. The last named investigator swabbed his own throat with a filtrate from an emulsion of influenza sputum without any result.

Gibson and Connor followed up the observation made by Nicolle and Lebailly by inoculating two monkeys subconjunctivally with filtered sputum from cases of influenza. Both became ill on the sixth and seventh day. One recovered after three days' illness, while the other was killed. The autopsy revealed a hemorrhagic exudate, in the lower lobes of both lungs. Two monkeys which had been used as controls, and inoculated with filtered and unfiltered sputum taken on the sixth day of the disease, remained unaffected.

Besides the usual bacterial flora, Tizzoni and Vernoni found a streptococcus-like organism which appeared to be intermediate be-

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tween the pneumococcus and the streptococcus. It produced death with accompanying pleural and peritoneal processes when injected into rabbits and mice.

Yamanouchi and his co-workers made an emulsion of sputum in Ringer's solution, and sprayed it into the nasal cavities of twelve healthy persons. Another series of twelve were sprayed with filtered (Berkefeld) emulsion. All except six of the twenty-four developed influenzal symptoms within two or three days. The six not affected had already had the disease. A filtrate of blood from influenza patients was injected into the nose of six others. They also presented symptoms.

Rosenau and his co-workers have been unsuccessful in producing an attack of influenza in healthy persons in a number of very interesting experiments. Altogether there were 100 volunteers, most of them being between the ages of eighteen and twenty-five years, few being in the neighborhood of thirty. It has been shown by statistical data, the most susceptible ages are between twenty and forty, so that this condition was eminently well fulfilled. They first attempted to inoculate nineteen volunteers with suspensions of Pfeiffer's bacillus of various strains, some even having been recently isolated from cadavers, by spraying the throats and noses of the volunteers. They emulsified the mucus and sputa from early typical influenza cases, and sprayed with the mixture. They injected 10 c.c. of citrated blood from cases in the febrile stage of influenza into 10 volunteers, and filtered mucus material was injected into four volunteers. They also allowed influenza patients to cough and breathe into the faces of ten volunteers. In no instance did the volunteers contract influenza.

Rosenau mentions the case of one of the assistant physicians who had been in contact with the disease from the start in October, and

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who came down with typical influenza thirty-six hours after collecting material from six healthy men at Portsmouth Navy Yard. None of these men contracted the disease.

Rosenau, from a long series of immunologic studies, has come to believe in the existence of a pandemic strain of green-producing streptococci, or diplostreptococci, in influenza. His experiments were carried out on guinea pigs, with which he succeeded in producing pathologic changes in the lungs simulating those of the human influenzal broncho-pneumonia. He remarks that many of the green-producing streptococci have acquired the character of hemolytic streptococci found at necropsy, and draws attention to the fact that they were agglutinated by specific hemolytic streptococcus serum.

Finally, Davis succeeded in producing temperature, and other signs of influenza in a human being inoculated with influenza bacilli from a case of pertussis. The symptoms abated on the third day. He believes that these symptoms, though not specific in character, might serve to modify secondarily a primary infection.

New Culture Methods

Improvements in bacterial culture methods were evolved when the necessity for more accurate detection of the influenza bacillus became apparent. The classical blood agar remains, while its preparation has undergone modification. The difficulty of detecting the minute dew drop colonies of influenza bacilli among those produced by other organisms contained in the bronchial or naso-pharyngeal secretions, has given rise to selective media which the discoverers claim have proved very effective. As a matter of fact, with the improvement of technique, there has been a considerable increase in the frequency with which the influenza bacillus has been identified in dejecta, exudates and tissues, as compared with the incidence reported

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during the earlier stages of the epidemic. Undoubtedly this increase must be ascribed to improved skill and cultural methods, as well as to awakened interest in the etiology of the disease.

Ecker, for example, took advantage of the solubility in bile of certain organisms found in the oral cavity, by mixing bronchial secretion with ½ per cent. Sodium Taurocholate Solution, and streaking this mixture in blood agar. Incubation at 37 degrees C. for twenty-four hours produced minute droplike colonies easily detected, and easily differentiated.

Avery made up a 2 per cent., or faintly alkaline agar to each 100 c.c.'s of which he added 1 c.c. of defibrinated serum free rabbit's blood, and enough Sodium Oleate to make the proportion of this substance 1 pt. per 1000. (Thus 5 c.c. of a 2 per cent. solution of Sodium Oleate are added to 95 c.c. of the agar.) This medium has led to an increase in the incidence of B. influenzae in actual cases of the disease and in convalescents.

Pritchett and Stillman, using Avery's oleate hemoglobin agar, succeeded in cultivating the Pfeiffer bacillus from the mouths of influenza and broncho-pneumonia patients in 93 per cent. of the cases, and in 43 per cent. of normal mouths.

Bernstein and Loewe report that agar with a gentian violet content of 1:5000 taking a concentrated solution of the dye as unity, yields a much higher percentage of positive results than plain blood agar.

This pseudo bacillus, which Pfeiffer (Zeitschrift fur Hygiene, 1893, 13, 356) isolated, is indistinguishable from the true bacillus except when artificially grown, when it forms thread-like growths. These leptothrix-like growths are then changed to the small bacillary form when grown on a medium, the optimum reaction for which was found to be 0.2 and which is practically neutral.

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A strain for influenza bacilli in tissues which may possess merit is recommended by MacCullum, who claims that it was devised by Goodpasture. The technique of the method is as follows:

Fixation in Zenker's formaldehyde solution and cut very thin sections.

1. Stain for from ten minutes to one-half hour in Goodpasture's stain which is:

30 per cent. alcohol	100 c.c.
Basic Fuchsin	0.59 gram.
Aniline	1.0 c.c.
Phenol crystals	1.0 gm.

2. Wash in water.

3. Differentiate in 40 per cent. formaldehyde solution only a few seconds bright color giving place to clear rose.

4. Wash.

5. Counterstain with saturated picric acid solution three to five minutes assumes purplish yellow stain.

6. Wash in water.

7. Differentiate in 95 per cent. alcohol, red reappears and same washed out, yellow also partly washed out.

8. Wash in water.

9. Stain in Sterling's gentian violet five minutes or more.

10. Wash in water.

11. Grams Iodine.

12. Blot without washing.

13. Aniline and Xylene (equal parts) until no more color comes away.

14. Two changes Xylene-Balsam.

Gram-negative organisms red, gram-positive blue. Tissues stain red and purple. Fibrin is sharply stained and the granules of most cells are prominent as red or purplish coccus like bodies.

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Therapeutics of Influenza and Influenzal Broncho-Pneumonia

General Treatment and Medication: The fact that no special line of treatment for influenza was of any avail, or was even known, was speedily impressed on the medical profession soon after the outbreak of the influenza pandemic. The result, of course, naturally was that each practitioner devised expedients which he applied on the spur of the moment, and under stress of necessity, and judged of the efficacy of his method of treatment according to the results obtained by him.

Even the patent and quack remedy inventors have reaped their harvest of shekels from the credulous and suffering people by advertising their "cures" broadcast in the newspapers, a condition which gave rise to the issue of a denial of a cure by the Journal of the American Medical Association and to the publication of a bulletin to the same effect by the Public Health Service.

The hygienic measures, such as cleanliness, attention to the functions of elimination, prevention of undue chilling, and above all a prolonged period of rest in bed, and avoidance of physical fatigue and strain after the temperature had dropped to normal soon became known, and were generally accepted with little difference of opinion. The medication, however, was a different matter, and followed somewhat the age old custom that the less there is known of a disease the more treatments there are for it. Not that some of the suggestions are devoid of merit, in fact all are based on more or less sound therapeutic principles, but the very indiscriminate nature of this sort of medication, even though for the most part systematic, leads one to infer that, to put it mildly, all methods could not have been of equal value. "The fewer the medicines the greater the number of cures," would seem to be especially applicable in the case of influenza. The

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various methods of treatment as they appeared in the literature, will be given without comment.

Strouse and Bloch prescribed acetyl-salicylic acid 10 gr., or Dover's powders 10 gr., with hot alkaline drinks and purgatives for the first two days. With signs of pneumonia, heroin or morphine were found to be the best sedatives. Also administration of large quantities of fluids of all kinds by mouth, when not retained, by rectum, either as plain tap water, or 5 per cent. glucose solution.

Cardiac stimulants, caffein and sodium benzoate by mouth, and hypodermically, were used but with questionable value. Camphor in oil, epinephrin in salt solution, and by hypodermoclysis, and atropin 1/6—1/100 gr. Pituitary solution did not seem to alter the course.

Synnott and Clark gave codein and heroin for cough, and medicated steam inhalations for laryngeal irritation. Digitalis was given early in full doses for forty-eight hours, then stopped or reduced to 1 or 2 doses daily after heart was digitalized.

Abdominal distention was combatted with pituitrin, or enema; water was given by proctoclysis, hypodermoclysis, or intravenously, in toxic conditions.

Atropin and belladonna proved of no value in lung edema. The diet they kept over 3,000 calories with gruels, broths, purees, eggs, milk, and cream, both in influenza and in pneumonia.

Berman held to a routine course of rest in bed, fresh air, light nourishing food, plenty of water, and open bowels. When a cough mixture was needed, he gave codein. Heaviness and soreness of the chest were combatted with home-made mustard plasters. He claims that he had 500 cases, and that it was rare to find pneumonia in influenza patients who went to bed at the beginning of the disease.

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Bernard Fantus also placed his patients in bed until all signs of the primary attack had ended, in the belief that too early leaving bed decreased the bodily resistance and brought about pneumonia.

Medication was systematic. With fever of 104 he used hydrotherapy, acetyl-salicylic acid, pyramidon, phenacetin, in small doses, with pain 0.03 gm. codein was added to the pyramidon. For cough ammonium chloride 0.3 gm. with syrup, and 0.1 gm. sodium iodide every hour. A tumbler of some fluid was given hourly, either as lemonade, grape juice, milk, or seltzer water. For sleeplessness 0.03 gm. codein, or the same amount of barbital at two hour intervals. Where barbital fails 0.3 gm. chloral hydrate may be tried, and with vomiting complete rest of stomach. Retention enemas of 250 c.c. of physiological salt solution with sodium carbonate (one teaspoonful to a quart) were given.

Fantus expresses the view that in as much as broncho-pneumonia is the great cause of death in influenza, it is preventable in the greater number of instances by prolonged rest in bed, copious use of fluids, expectorants, including iodides, and no opiates.

Myers advances the opinion that coughing produces trauma in the respiratory tract which helps bring on secondary infection, and pneumonia. With this idea in view he advises the use of diacetylmorphine in 1/12 to 1/6 grain doses in tablet triturate form.

With the idea that bacterial infection produces substances which give rise to the symptoms of histamin poisoning and shock, and that patients died principally because of shock to the cardiovascular system, accompanied by a slackening of the capillary circulation and acidosis, Keeton and Cushman gave maximal quantities of fluids by mouth, rectum, and skin. Alkalis did not appeal to the authors. The use of digitalis and atropin, especially the latter, relieved cyanosis.

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They did not find that either venesection or the injection of hypertonic glucose solution was of any value whatever.

The treatment of patients at Camp Sherman, Ohio, according to Friedlander, comprised the usual avoidance of undue exposure, rest in bed, free purgation, gargles, acetyl-salicylic acid, and Dover's powders. Patients were kept in bed for seven days after temperature had become normal.

Influenza made its appearance in the U. S. Naval Hospital at League Island on September 12, 1918. Six hundred cases were observed, of which 168 developed pneumonia, and forty-eight died. Dever and his associates, who report on this epidemic, found that rest in bed, with magnesium sulphate Dover's powders, lemonade, tea and milk, was of assistance. Mustard plaster for pains or oppression in the chest, or a small dose of codein, was effective. When pains became severe acetyl-salicylic acid, in 5 grain doses, was given and a half an ounce of Liq. Potass. Citratis was given until the acute stage had passed.

Tincture of nux vomica, strychnine, or caffein, were frequently used as stimulants. Whiskey was not given when nausea, or gastro-intestinal symptoms were present. Water in large quantities, and plenty of food regardless of fever was allowed.

At the meeting of the American Public Health Association, Strouse said that besides keeping strictly to the bed until the case develops one way or another, the only medication advisable was digitalis, salicylic acid, and a saline expectorant, and when necessary, an opium alkaloid. Pietrowicz and Goldsmith advocated strictly open air treatment.

At a meeting of the American Therapeutic Society held at Atlantic City, June 6 and 7, 1919, Diners expressed the opinion that no

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standard method of treatment had yet been arrived at. He admits that his own was subject to variations.

The main features of Diners' treatment are, bed in properly ventilated room at 70 degrees F. temperature, warm baths, ten grains of quinine and Dover's powders are given. Also hot lemonade, whiskey, and hot water bags to the feet. Copious sweating was induced. Cascara was the cathartic. Nourishing food was given at frequent intervals. With blood pressure below 110, epinephrin, 3-5 drops of a 1:1000 solution, was given. When rales could be heard, hot flax-seed poultices were applied every half hour, and digitalis and epinephrin were used. If the sputum was tenacious, ammonium salts, 5-10 gr., were given; if liquid, codein. Pleuritic complications were treated by hot applications and strapping; if necessary, aspiration and thoracotomy. The pleura was irrigated with saline solution.

Rood found the use of ergotin and epinephrin practically useless in influenzal pneumonia. Locke's solution with 13 per cent. acacia was given intravenously (the colloid to combat the toxin's absorption) two to three times a day at six to eight hour intervals. Its action was striking, he says. Bromides and chlorides were given, as well as codein. Immune serum from a convalescent patient was used, but in one case only with apparently good results. Lung puncture with temporary pneumothorax gave relief. He allowed 100-150 c.c. of air into pleural cavity of three patients, whose condition appeared hopeless. Two recovered, and the third was improved, and life apparently prolonged for forty-eight hours. Rales disappeared and were replaced by breath sounds in these cases.

Cohen found salicin, sodium salicylate, quinine salicylate, and cinchonidin salicylate useful, while he regards cocaine as the "one drug that antagonizes the influenza poison," and Goldstein found that

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his patients were benefited by the use of digitan (digipuratum), caffeine and codeine, while for the cough benzyl-benzoate gave relief.

Lambert believes in the free use of salicin and salicylates to relieve distress in influenza. Ammonium salicylate and ammonium carbonate in 5 gr. doses every two hours were given. In pneumonia congestion, ergot extract with extract of nux vomica and gentian, ½ gr. each every two hours, seemed to produce favorable results. Spraying of the throat persistently with a silver salt aided in confining the infection to the upper air passages, he thinks.

Treatment is symptomatic, according to the article under Therapeutics, J. A. M. A. Acetyl-salicylic acid in 15 grain doses is given every three hours. Warm baths may give relief. The mouth should be kept clean, and elimination with water and drinks stimulated.

When pneumonia threatens, warm packs with cold to the head. Stimulants for the failing heart are indicated. Small doses of epinephrin, salts, magnesium citrate, and calomel to relieve toxemia.

Foreign Suggestions

The intravenous use of bichloride of mercury was suggested by Bacelli in 1907 in the treatment of gonorrheal arthritis, and Perez has used it in puerperal septicemia in doses as high as 10 c.c. of a 1:1000 solution.

Ferrarini in Italy advocated a daily intravenous injection of 0.01 gram mercuric chloride in 1 c.c. physiological salt solution. He observed good effects in 100 cases with the treatment which he begins at the first sign of lung congestion. It was, however, effective even as late as the fifth and seventh day; patients who had seemed doomed, recovering. Vecki, in this country, used 3 to 5 c.c. of a 1:1000 mercury bichloride intravenously with excellent results.

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Orlando administered creosote by inunction into the axilla, and claims to have had good results, few of the pneumonia patients dying. He believes that given thus, it enters the lymphatics and then gets into the blood stream and capillaries of the lung tissues. The dose for inunction was 10 minims, with one-half minim in water given internally. He claims to have aborted incipient pneumonia in this manner.

Maurice believes that in as much as the sympathetic nervous system is most affected by influenza, and produces the so-called post influenzal asthenia, arsenic and strychnine are indicated. These he gave together with calcium chloride, 2 grains, and epinephrin, 15 drops, daily for several weeks. Similar views are shared by Ruiz, but he believes that the medulla is most affected by the virus.

Renaud has achieved excellent results in 146 grave cases of influenza by giving an intravenous injection of 0.25 mg. of epinephrin, together with 20 to 40 c.c. of anti-pneumococcus serum. The vasomotor stimulus favors the action of the serum, he thinks.

Loeper and Fumoze found 10 per cent. of their influenza cases developed a type in which asphyxia and vaso- and vago-paralyses were prominent. Venesection, followed by subcutaneous injections of sugar, or epinephrin, in saline, together with daily intravenous injections of 2 c.c. of a 10 per cent. camphorated oil, saved 55 to 60 per cent. of their thirty-eight patients.

Alvarez gives iodine internally, and sodium sulphate in enemas. He finds such treatment has been especially beneficial in his cases. Five drops of tincture of iodine are given with milk or coffee every three hours. As a prophylactic 15 drops are given to an adult every eight hours.

Moore thinks that alcoholic stimulation should be avoided as much as possible in influenza, and suggests a "turpentine punch" made

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by dropping 10 drops of turpentine on a lump of sugar added in a wineglassful of whiskey punch, as being of value.

Vaccine Treatment

Vaccine treatment, like vaccine prophylaxis (which will be considered under the appropriate heading) has, in view of the lack of distinct and certain information on the etiology of influenza, been largely a matter of experiment. In fact it may be said that little importance has been attached to vaccine therapy in this country, and the only definite reports on its use are in the literature of foreign countries. In America, serum and blood therapy appear to have been given preference. So far as can be made out, any results at all worthy of being called successful, have been obtained by using the vaccine only in cases of influenzal broncho-pneumonia. In these cases the attempt to produce vaccines has been necessarily guided by the nature of the organisms which were found present, and the therapy could then, of course, be based on rational principles. The difficulties which arose here were for the most part of a local nature, and were due in a great measure to the diversity and distribution, as well as the variability of the strain or group of organisms which prevailed in the affected area. This variability has been pointed out under "Etiology," and doubtless accounts for the divergent opinions as to the value of vaccines produced in bulk in distant parts of the country, and shipped to epidemic centers. It may be said that vaccines made on the spot from organisms prevailing in such centers, generally appear to have possessed greater therapeutic value than those received from outside sources.

The results of the vaccine treatment on the primary infection, seem to be a matter of conjecture, very likely on account of the short duration of the infection, which either resolved or went on into sec-

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ondary complications. The value of the treatment during the first phase could only be inferred by the relative number of patients who passed through it without developing secondary pulmonic involvement.

Fox, in the U. S., claims to have prepared a sero-bacterin from the serum of patients who have recovered from simple influenza, and suspending in it pneumococci Types I and IV, two strains of influenza, one strain of hemolytic streptococci, and one of the non-hemolytic streptococci. Dosages of 100 mill., 200 mill., and 400 mill. were given at intervals of twelve hours. Following a 6 to 12 hr. negative stage, there was an increase of 300 per cent in the leucocytes within eighteen hours. Fox says that with forty uncomplicated cases no pneumonia occurred, and that seven out of nine pneumonias appeared to be benefited by this treatment.

Wynn at first expressed disbelief in the efficacy of vaccines, though he did concede a drop in temperature followed their use. He appears to have changed his views somewhat, for he came out with a statement later to the effect, that prompt treatment with a vaccine containing pneumococci, streptococci, and influenza bacilli will abort an attack of influenza if given early. He believes that broncho-pneumonia is also favorably influenced by vaccine, and doses adequate to produce a fall in temperature should be given.

A vaccine consisting of B. influenzae 60 mill., streptococci 80 mill., pneumococci 200 mill. per c.c., has been given with good effect in the treatment of influenza, according to Tottenham. On admission the patient is given 0.112 c.c. of the vaccine, repeated as often as necessary every forty-eight hours, increasing if necessary after the first dose has been given.

In Whittingham and Sims cases, they found it most expedient to give full doses of their vaccine in very early cases, though with pronounced symptoms they employed serum treatment.

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Robertson used a vaccine made from influenza bacilli in 100 cases of typical infection. Focal and general reactions were produced, and Robertson believes that the therapeutic results achieved were consistent with the view that this bacillus was the chief cause of the catarrhal conditions from which the patients suffered. Overdoses produced symptoms similar to influenza itself.

In the treatment of acute influenza, a dose of 0.02 mg. repeated after twenty-four hours, generally caused the temperature to fall to normal within forty-eight hours.

Sensitized influenza bacilli as a vaccine have been used by Kitano as prophylactic and in treatment. In uncomplicated cases the mortality was nil; in influenzal pneumonia cases so treated the mortality was 23 per cent. The number of days of illness was shortened from an average of 17.2 to from 7 to 10. No results of the prophylaxis appear in the abstract, though it is said that 10,300 have received the treatment, and only 285 developed untoward symptoms. The dose was 0.2 mg. bacilli in each 1 c.c. of suspension.

Injection of Foreign Proteins

The idea of protein therapy seems to have been suggested by the work of Miller and Lusk, and Snyder, who made use of typhoid vaccine injected intravenously in cases of arthritis. Others have extended the application of foreign protein to the treatment of influenzal pneumonia, though according to Cowie and Beaven its usefulness is limited, and only indicated in the beginning stages of pneumonia. It is contraindicated after the third day, or where there is myocardial insufficiency, or acute endocarditis. The immediate effect of the foreign protein is a so-called protein paroxysm, followed by a drop in temperature, and an improvement in the subjective symptoms. They found no marked improvement in the leucopenia. The

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pulse, respiration, and other signs are negligible. They conclude that the injections may bring about the termination of the disease within from one to three days. The dose is preferably 500 mill. with at least one day interval between doses.

After having tried hypodermic injections of influenza bacilli in well controlled series of cases, without any good results being apparent, Roberts and Cory decided on the intravenous method, proceeding on the assumption that the production of antibodies of various kinds, is stimulated by foreign protein.

Their vaccine consisted of a saline suspension of killed organisms, each cubic centimeter of which contained 100 mill. influenza bacilli, 100 mill. staphylococci, 100 mill. streptococci, and 100 mill. pneumococci, Types II and III. At first they began with 0.5 c.c., and doubled the dose daily until four doses had been given. Later, the initial dose was raised to 1 c.c.

The reaction usually set in one-half hour after the injection, and in no case were the symptoms such as to warrant the continuance of the treatment. Two hundred cases treated in this manner had a mortality of 9.5 per cent., while a series of eighty-six cases treated in the usual way gave a mortality of 27 or 31.2 per cent.

Convalescent Serum

Convalescent patient's serum was apparently first used in the treatment of influenza cases by McGuire and Redden. The blood was taken from patients as soon as convalescence had been well established, and within a week or ten days after the temperature had become normal. Blood to the amount of 800 c.c. was taken from each donor, 400 c.c. on two successive days. The blood was allowed to clot, and the separated serum centrifuged. Each donor thus gave about 300 c.c. of serum. Seventy-five to 125 c.c. were given in-

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travenously at a dose, after Wassermann and compatibility tests had been made. Three received 100 c.c., and two received 600 to 700 c.c. of serum. The interval was eight to sixteen hours between each dose. Results were evident within twenty-four hours. The serum, they assert, should be given within the first forty-eight hours after consolidation has commenced.

At the time their first article was published thirty out of thirty-seven patients had been treated. Later in a second report, out of 151 patients, 132 had received three doses or less, of the serum, two-thirds had received only two injections, and one-third one injection. The average dose was 120 c.c. Of 138 patients eighty-three recovered by crisis, fifty-five by lysis. In 148 cases over one-half showed a normal temperature within forty-eight hours after beginning the serum treatment. The authors believe that pooled serum from convalescent influenzal broncho-pneumonia patients has greatly reduced the mortality. A description of their methods for collecting the blood, and separating the serum, is given in their article.

Kahn's method for preparing convalescent serum, which was published later than McGuire and Redden's article, is simple enough. He drew the blood from influenzal broncho-pneumonia and convalescent patients into a sterile flask, allowed it to stand twelve to eighteen hours in the refrigerator, and then decanted the serum. Each patient received 100 c.c. of this serum intravenously at a dose, sometimes after withdrawing 50 to 60 c.c. of blood from the recipient.

At the meeting of the American Public Health Association, Bundison expressed the opinion that convalescent serum treatment was of great value when given early. He gave 200 c.c. of serum at a dose, and if the temperature did not drop in a short time, another 200 c.c. were given.

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Stitt also favored the use of convalescent serum which he had found to produce successful results. He could, however, find no evidence of antibodies for the various strains of influenza bacilli.

Specific Antisera

Specific antisera have no doubt been tried in influenza and its complications far oftener than appears in the literature. Synnott and Clark used serum of Type I pneumococcus intravenously after desensitization (5 c.c. subcutaneously) in doses of 60 to 100 c.c. at twelve-hour intervals until the temperature became constant. It was also given intraspinally in 20 c.c. doses where meningeal involvement was indicated. Dever and Boles, and their associates, did the same whenever it could be proven that Type I was present, while Stone and Swift believe that Cole's Type I antipneumococcic used in conjunction with other type sera, may be effective, but that the streptococcic antisera are, at the present time at least, not of much value.

Miscellaneous Treatment

Pari injected the sputum from twenty severe cases, diluted with saline solution and sterilized in the autoclave. The first injection was 1 c.c., followed forty-eight hours afterward by 2 c.c., then 3, and finally 4 c.c. A drop in temperature followed each injection. He says that this so-called pyotherapy is also effective in whooping cough. A similar procedure is mentioned by the "Indianapolis News," for June 17 as having been used, by Dr. Charles H. Duncan, in 246 patients without a single fatality. No record, however, was noted in the medical literature examined.

Anastassiades produced a blister on the chest of influenza patients, and injected 0.3 to 0.5 c.c. of the blister fluid, after mixing it with strychnine, morphine, and caffeine, as indicated. Injections are

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made in three places on the body. The beneficial effect was apparent within thirty-six to fifty-eight hours after making the injections. The mortality among 234 patients was 6 per cent.

Sylvester believes that the malarial infection, and not the quinine treatment, was responsible for the immunity which patients suffering from this disease enjoyed during the influenza epidemic. He bases this assumption on the manner in which secondary infections crowd out the influenza virus. The immunity extends to other diseases while they last, and influenza may occur during the latent period of malaria.

Pregnancy Complicated by Influenza

Pregnancy complicated by influenza has in the experience of most clinicians and practitioners been a most peculiarly fatal combination of circumstances. In spite of this very vital outstanding fact scarcely anything has so far appeared in the literature on the subject. One attempt has been made by Harris to come to some definite conclusion as to the relative mortality among women afflicted with the disease during the period of gestation. He studied the statistics of 1,350 women in various stages of pregnancy who had been attacked by influenza, half of whom suffered from influenzal pneumonia. Of the latter 50 per cent. died. In 26 per cent. of the uncomplicated cases, pregnancy was interrupted and 52 per cent. of the pneumonia cases aborted. In cases ending fatally premature labor occurred in 62 per cent., and in 38 per cent. the patient died without pregnancy being interrupted. The mortality was 41 per cent. in cases complicated by abortion or premature labor, and 16 per cent. in those in which pregnancy was interrupted. The gross mortality for all cases was 27 per cent.

Epidemic influenza caused abortion, miscarriage, or premature labor in 42 per cent. of 50 cases handled by Titus and Jamison, with

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a mortality of seventeen, or 80.9 per cent. of the twenty-one women affected.

The treatment advocated by Titus and Jamison consists in preventing exposure, and in case of infection, absolute rest and fresh air, early stimulation, free elimination, avoidance of violent purging, sedatives as required, and forceps delivery when premature labor comes on, as soon as the cervix is dilated. In case of hemorrhage, uterine pack and hypodermoclysis is indicated. No anesthetic should be given.

Prophylaxis

Quarantine and the closing of public places, especially schools, did not always meet with favorable reception from the medical profession. The opposition no doubt in most cases depended upon experience or judgment, sometimes upon personal prejudice, an attitude for which no adequate reason can be given.

In theory, quarantine would seem to be an ideal prophylactic measure. Where it cannot be adequately enforced, as was the case when a highly infectious disease like influenza spread throughout the population, an attempt to apply it in fact becomes an illusion. This, I believe, is the standpoint most hygienists and public health experts take, and admit that the best that could have been done was to appeal to the public to take the precautions which neither they, nor the police, could force it to do. This appeal to the personal safety, evidently struck a responsive note in a bewildered public during the great pandemic, probably because the mass of people have an understanding of, and a confidence in, the efforts of the various state health organizations, and showed themselves willing to co-operate for mutual benefit.

The question of closing the public places of amusement and assemblage was a measure upon which most of the authorities were in

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agreement, with one exception, the schools. In case of schools, many were of the opinion that children playing in the streets, and mingling with adult members of their own families or neighbors, who might themselves be infected, or were carriers of influenza, were exposed to a greater risk than if sent to school and kept in well ventilated sanitary rooms. The possibility of detecting and eliminating the children who might show signs of infection was thought to still further minimize the dangers.

The larger problems of organization, and educational propaganda, as well as a general outline of a plan of action against influenza were discussed, and very properly attended to by the members and Special Committee of The American Public Health Association. Their suggestions were published, however, after the epidemic in most localities had reached its maximum, and was steadily on the decline.

Quarantine regulations of the Illinois Department of Health provided for internment until all clinical manifestations of the disease had subsided, and temperature had become normal for three days, while New York City also quarantined, and sent those patients so situated as to become a menace to the community to the hospitals.

The Medical Division of the Navy recognized that quarantine and isolation were impracticable, but recommended in its Bulletin 87, August 9, 1918, that bed isolation should be practiced to prevent droplet infection with sheets hung up between the patients. It also recommended the disinfection of all mess gear.

Modes of Transmission of the Disease

The conviction is practically general that the spread of influenza from person to person is due primarily to transfer of material from infected oral cavities. Soper says that it may be regarded as a "fundamental assumption that influenza is produced when, only when, ma-

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terial from the mouth or nose of an infected person gets into the mouth or nose of some one who is susceptible."

It is significant in this connection that Strouse and Bloch succeeded in cultivating the hemolytic streptococcus originally derived from the exhalations of patients suffering from influenza from the walls of one of the wards.

Another observation quite similar in character, one which at least emphasizes the possibility of aerial transmission by droplets, and which, moreover, is a weighty argument in favor of masks, is that made by Medalia. He reports the primary infection of wounds with streptococcus hemolyticus from adhesive plaster, which had been stuck to the walls of the operating room, prior to being used to fasten bandages over wounds. He says that the bacillus influenza was present in large numbers in case after case, and that with the primary infection with the streptococcus there was pyrexia for a few days, together with slight irritation of the throat. The inference apparently is that patients suffering from influenza had been operated on, and thus contaminated the air of the room, and the infection had clung to the walls. Many are of the opinion that the hand also plays a prominent part, though secondary to that taken by coughing and sneezing, and the effort to restrict the spread of the contagion from this source, had as a result the general recommendation of the gauze mask as a prophylactic measure. The mask in itself is no novelty, having been used for years in hospital wards, and surgical amphitheatres for similar, though more restricted, purposes. It was its more or less universal use which put the mask to strict practical tests on a large scale, bringing upon it commendation or censure, depending on the whim or experience of the observers.

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The Face Mask

The face mask, especially as regards its utility as a means of preventing the spread of the contagion, and transmission by droplet infection, has aroused considerable controversy, so that in order to obtain a clearer understanding of the role which the gauze mask was expected to play as mechanical obstruction to finely divided germ bearing mucus, and saliva droplets, it will be necessary to review some of the literature of the experimental work along these lines.

Doust and Lyon conclude from their experiments that infected material was rarely ever projected farther than a distance of four feet during loud speech, in other words a danger zone four feet across exists around every person. Coughing projects material ten feet; the zone of a coughing patient lies, therefore, within a radius of this length.

They found that masks of coarse or medium gauze, of from two to ten layers, do not prevent the projection of infected material from the mouth during coughing. Such masks are worthless in preventing the spread of respiratory infection.

A three-layer butter cloth mask was found to be efficient in preventing the spread of infection during coughing and speaking. This mask was constructed in sizes of 6 x 8 inches hemmed on the edges, and provided with four tapes at the corners.

It should be stated that these experiments were carried out with an innocuous organism, the B. prodigiosis, which suspended in saline was swabbed on, or sprayed into the nasal and oral cavities of the experimenters.

Weaver, who has done considerable work with face masks, concluded that the best kind, and the ones which were used in the Durand Hospital, were those made of gauze, mesh 44 x 40. Nurses in this hospital were instructed to use two super-imposed masks, making six

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layers of gauze, when working with infectious diseases. The mask, he claims, has an additional benefit aside from holding back droplets, of preventing nurses and doctors from putting their hands to their faces and mouths during examination. He believes that the spread of scarlet fever and diphtheria was prevented by their use.

As will be seen later, many have suspected that not only the hands and the mouth and the nose may be the place of entrance of the virus, but that the conjunctival spaces may play as definite, and perhaps even a more conclusive part, in the transmission of influenza. The neglect of this port of entry could, therefore, be the cause of the often reported failure of the face mask which, of course, covered only the nose and mouth. At any rate Maxcy has succeeded in demonstrating the possibility of infecting the naso-pharynx by way of the conjunctival and the lacrimal ducts, by means of a spray of bacillary emulsion, at a distance of three or four feet. The organism used was B. prodigiosus, and this could be recovered from the nose within five minutes and from the naso-pharynx within fifteen minutes after using the spray. The mask used to cover the mouth and nose was made according to the specifications of Doust and Lyon. He believes that in order to afford complete protection goggles should be worn in addition to the masks, and points to the effective results of covering the entire face as employed in the pneumonic plague. It would seem that these experiments, while very simple, demonstrate conclusively a possible means of transmission of respiratory diseases which has heretofore received but little attention.

The practical application of the face mask on the largest scale in any community was probably in the case of San Francisco, the mayor issuing a proclamation making the wearing of masks compulsory in all public places, and wherever people congregate. The Indianapolis Board of Health issued a similar order on November 18.

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Aside from these two, there do not appear to have been any other large communities coming under this general ruling.

At the meeting of the A. P. H. A., Kellogg is quoted as having said that the masks in San Francisco proved most efficacious, though later this statement was corrected on the grounds that his discussion had been improperly reported the first time. He claims that while the death rate for San Francisco was 4.6 per 1,000, that of Los Angeles (which was not masked) was 3.3 (about the same as Chicago), and that though the State Board was "importuned" to put the mask on Los Angeles, they considered that the results (presumably those in San Francisco) did not justify it.

Kellogg, however, believed that a mask properly worn can prove an efficient protection against disease transmission, but thinks that this is hardly a condition to be brought about in a large community. The careless construction, and the tendency to remove them during work, make their use illusory. His faith appears to have been somewhat weakened by the further observation, that the San Francisco Hospital had an incidence of 78 per cent. among the trained nurses, even though they used masks, and the inference naturally is (in their case at least) that they contracted the infection through the masks, though the latter were properly made, and constantly worn.

Vaughn expressed the opinion that the value of the masks was overestimated, and that hand to mouth was more important than droplet infection. Delameter did not advocate them, and Inches regarded the wearing of masks in the streets as a pure fake. He said that when everything was wide open, there were less cases than with the closing ordinance enforced.

All attendants, helpers, nurses and physicians at the Chicago State Hospital wore face masks. Only three nurses became infected,

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while in the isolation ward these attacks were mild, and Foley believes they were contracted through carelessness.

The British Local Government Board published a memorandum advising against the general use of the face mask, and the committee called to consider the influenza situation also held that while it should be employed in hospitals by all exposed to infection, and by barbers, dentists, etc., "the evidence before the committee as to the enforced wearing of masks by the entire population was at all times contradictory."

Lee stated that masks and goggles were used at the French hospital to which he had been attached, and in addition all precautions, such as cleanliness, even to antiseptic baths, were adopted to prevent the spread of the infection.

Jensen, in Copenhagen, employed strict isolation, the wearing of overgarments and masks, and succeeded in restricting the epidemic to one case in each of ten families. Though the population of the town he worked in was less than a thousand, the houses were small, and sometimes ten persons slept in a room.

Sahli disapproved of the face mask, and says that infection by way of the conjunctiva is also very likely possible. It would be more rational for the patient to wear the mask, were it not for the fact that it hinders his already disturbed breathing. Ample protection is obtained by shielding the eyes with goggles, and by covering the coughing patient's mouth with a towel, or a flap of the shirt during examination.

Other Prophylactic Measures

Gargles, sprays, douches, drops, powders, etc., have not failed to be advocated as prophylactic measures in influenza. The only ones in this country to recommend anything of this sort appear to be Synnott and Clark, who besides destroying sputum, etc., as already

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mentioned, also used a nasal disinfectant composed of 2 per cent. tincture of iodine in normal saline. Besides this, though not cited in the literature, the dropping of 10 per cent. collargol into the nose has been practiced to some extent; with what effect is not known. The A. P. H. A. Committee investigated sprays, gargles, etc., and pronounced them worthless.

Bach blows a mixture of impalpable boric acid, 95 pts., sodium bicarbonate, 3 pts., and calomel, 2 pts., into the noses with a pressure blower, every four to six hours. This mixture alters the osmotic pressure on the surface of the mucosa, and causes a free flow of mucus which washes out bacteria. "Infection," he claims, "was prevented in practically 100 per cent. when the treatment was properly applied." Alvarez gave 15 drops of tincture of iodine internally every eight hours, as a prophylactic for an adult.

Thompson, in Great Britain, thinks that sprays are worse than useless in the treatment of influenza and may spread the infection. Better, he thinks, is a mixture of menthol, one-half dram, tincture of eucalytus, 3 oz., a teaspoonful of this mixture put into a jug of steaming water, and inhaled "up and down the nose" every two or three hours.

At a conference held at the Institute of Hygiene in London, Sir Malcolm Morris disapproved of the use of permanganate and salt solution for washing the nostrils. He said he had found collodial silver beneficial.

Prophylactic Vaccination

Prophylactic vaccination against influenza and its complications has naturally received a great deal of attention from the medical profession. Much effort has been expended in trying to find the right bacterial mixture which would prove of universal application. It is quite probable that an unknown virus, or variation both in the organ-

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isms and in the strains of these organisms in different localities, and possibly in individual patients, is responsible for the lack of success with any one vaccine, and for the conflicting reports. As far back as October, 1918, The Journal of the American Medical Association in an editorial expressed the opinion that no vaccine had become available for the prevention of influenza, and goes on to say that the fact that "thousands have been vaccinated with apparently good results means nothing;" as yet "there is no basis on which promise of protection from vaccines may be made. They may be harmless and they may or may not be of preventive value." In November the same Journal summarizes the situation by asserting that—"Vaccination against influenza is in a wholly experimental stage . . . .," and in January the editor remarks that according to the report of the Committee of the American Public Health Association the difficulties lie not so much with the apparent contradictions in the reports, but that what is claimed to be evidence is not evidence, for the lack both of essential features, and of the proper evaluation of facts observed. We may conclude from the observations of men best qualified to judge both at this time and later, that they were for the most part confused and undecided, but that the opinion generally held was that reflected by the Journal's editorial and comment.

At the meeting of the A. P. H. A., Vaughn stated that vaccine in great quantities had been used at Army Camps and "I do not hesitate to say that it has not done one bit of good," though he admitted that vaccination against pneumonia was sometimes effective, at least encouraging.

The first individual report on vaccination as a prophylactic to appear in the literature, seems to be that of McCoy, Murray and Teeter who tried out the vaccine prepared by Tonney, of the Chicago Health Department Laboratory.

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One cubic centimeter of this vaccine contained B. influenzae 500 mill., pneumococcus Type I, 500 mill.; II, 500 mill.; III, 500 mill.; IV, 1,500 mill.; streptococcus hemolyticus, 1,000 mill.; staphylococcus pyogenes, 500 mill.

Leary's vaccine was tried by Barnes on 152 persons. Sixteen per cent. developed influenza, while 20 per cent. of 113 unvaccinated controls became infected. The doses were 400, 800, and 1,200 mill. at twenty-four hour intervals.

At the Puget Sound Navy Yard, Ely and his associates prepared a vaccine from mixed virulent strains of hemolytic streptococci grown twenty-four hours in 1 per cent. glucose broth, with 1 per cent. sheep serum added. After twenty-four hours the organisms are centrifuged out of the supernatant fluid and mixed with the filtered sediment.

The use of lipo-vaccine, i. e., a vaccine suspended in an oil, presents certain features which have seemed to recommend its use. The one great advantage besides the keeping qualities of course lies in the relatively slow absorption, and with that the possibility of making one dose sufficiently large to render subsequent injections unnecessary.

This form of vaccine has been applied by Fennel, who used the lipo-vaccines of the pneumococci Types I, II, and III, prepared at the Army Medical School. The desiccated bacteria are weighed instead of being diluted. Fennel cites cases to prove its protective action against influenza.

Rosenow found that the bacteria in the complications were of especially high virulence. The influenza bacillus itself appears to have acquired a peculiar virulence. He disregarded the initial cause of the infection and considered primarily the possibility of immunizing persons against the bacteria which cause the secondary symptoms,

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and are considered to be the cause of death, viz., pneumococci, streptococci, staphylococci, and influenza bacilli. It was hoped to raise the resistance of persons to these organisms and decrease the death rate from pneumonia.

Examination of sputum from lungs revealed a streptococcus which produced greenish colonies, and which presented cultural features of both streptococcus viridans and of the pneumococcus on solid media. It is not soluble in bile. Staphylococci and influenza bacilli were thought to play a minor role. The vaccine consisted of pneumococci Types I (10 per cent.), II (14 per cent.), and III (6 per cent.), together 30 per cent.; pneumococcus group IV, and the allied diplostreptococci already mentioned 30 per cent.; hemolytic streptococci 20 per cent.; staphylococcus aureus 10 per cent.; influenza bacilli 10 per cent.

The results obtained from a more extensive use of the vaccine are embodied in a later publication by Rosenow and Sturdivant. The vaccine used was virtually the same as before, with the exception that influenza bacilli were left out, and there was a higher percentage of the green producing streptococci added. At first each c.c. contained 5,000 mill. bacteria, later the concentration was doubled, and the quantity of liquid reduced by a half. Subcutaneous injections were given once a week. The first dose was 0.25 c.c. containing 2,500 mill., the second, 0.5 c.c., 5,000 mill., and the last 0.75 c.c. or 7,500 mill. micro-organisms. The reactions were usually mild, and while some patients reacted very severely, in no case were the symptoms alarming.

Vaccinations were begun soon after the onset of the epidemic, and covered a period of six weeks, and reports were received from various sources as a result of questionnaires sent out with the vaccine. Excerpts from the tables will probably show that the observers' optimism is justified:

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INFLUENZA

Vaccinated once—
4,828; Influenza 115.1; Pneumonia 8.28; Deaths 0.2
Vaccinated twice—
4,029; Influenza 88.3; Pneumonia 3.7 ; Deaths 3.2
Vaccinated three times—
17,532; Influenza 102.8; Pneumonia 4.2 ; Deaths 0.8
Not vaccinated—
36,100; Influenza 373.5; Pneumonia 20.4 ; Deaths 6.35

In Olmstead County, Exclusive of the Mayo Clinic and Insane Hospital, Per 1,000

Vaccinated once—
2,424; Influenza 100.2; Pneumonia 6.1 ; Deaths 3.2
Vaccinated twice—
1,021; Influenza 291.8; Pneumonia .0 ; Deaths 6.7
Vaccinated three times—
9,300; Influenza 41.0; Pneumonia 3.9 ; Deaths 0.64
Not vaccinated—
8,700; Influenza 248.0; Pneumonia 13.1 ; Deaths 4.0

Results from All Sources Incidence Per 1,000

Vaccinated once—
26,936; Influenza 118.2; Pneumonia 8.7 ; Deaths 3.0
Vaccinated twice—
23,348; Influenza 97.0; Pneumonia 3.04; Deaths 2.62
Vaccinated three times—
93,476; Influenza 87.0; Pneumonia 4.4 ; Deaths 1.43
Not vaccinated—
345,133; Influenza 281.8; Pneumonia 21.0 ; Deaths 8.55

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INFLUENZA

Results Obtained by Prophylactic Vaccination During Pregnancy

Vaccinated three times, 997; Influenza 109.3 (per 1,000); Pneumonia 27.0 (per 100); Deaths 12 per cent.

Not vaccinated 3,656; Influenza 294.6 (per 1,000); Pneumonia 80; Deaths 20 per cent.

A lipo-vaccine has been made with the same composition as the one given, and 500 doses have been used.

Does an Attack of Influenza Confer Immunity?

It would certainly be a gross contradiction to their expressions of belief if those experimenters who are so ardently trying to produce a vaccine were not convinced that immunity was conferred by an attack of influenza. In other words if they did not believe this actually to be the case, the advocacy of their individual products, and the publication of articles would amount to nothing more than unethical attempts to gain notoriety. Nor should the argument revolve about the period of immunity, so long as this is of sufficient duration to protect an individual against a second attack during an epidemic, though repeated attacks in isolated cases, within brief intervals of one another, is no negation of the assumption of an immunity. It may simply mean that these persons did not, because of an "idiosyncrasy," respond to the infection by the formation of protective antibodies. Instances are not lacking where two or more attacks of what appeared to be influenza, have occurred one and two weeks apart, and have led many careful observers to the conclusion that one attack produces very slight if any immunity whatever; certainly not long enough to act as a protective barrier against another infection. It would be interesting to know something of the statistics of reputed second and third attacks during the epidemic.

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INFLUENZA

On the other hand, there is some evidence from physicians who are thoroughly convinced that immunity is produced. In fact no less a clinician than the famous Sahli believes that the experience and observations uphold the assumption of an immunity after an attack, and that relapses are due, not to reinfection, but to the temporary reduction of the immune bodies which have been formed while the germs still exist in the mouth. Between epidemics Sahli thinks that the influenza bacilli exist as saprophytes. He holds it probable that those who escaped during the pandemic, did so because they had been progressively immunized by inhaling small quantities of virus at a time. (See also Sahli's idea of symbiotic relationship under "Etiology.")

The epidemic of influenza which swept Rome in May and June, affected eighty nurses of the Spezia Hospital, according to Scoccia, but on its return in September not a single one contracted the disease. The conclusion is obvious.

Similar observations were made in Spain and England, where succeeding waves visited localities which had for some reason escaped during the first one.

In this country the only ones to publish more than the bare assertion of an opinion are Hamilton and Leonard. Their observations were carried out in a girls' training school, having at the time of the epidemic about 180 students.

There were two outbreaks, the first being in November, 1918, and the second in January, 1919. Hamilton and Leonard point to what they believe is an acquired immunity developed by those having an attack during the period of the first invasion, because during this time all efforts were made (and with success) to confine the disease to two or three cottages. During the second outbreak the inmates of these cottages remained free of the disease, while all the others

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suffered. Altogether 158 of the 180 girls were attacked at one time or another during the epidemic. The assumption naturally is that the immunity lasted at least two months.

Argument and Conclusion

I believe that one who has made a survey of the existing literature must be compelled, principally through the lack of definite data, to agree that few fixed conclusions can be arrived at. The expressions of opinions are so often at variance with one another, and the observations in many respects so superficial and incomplete, that one must conclude, as did the Committee of the American Public Health Association as far back as last December, that the results obtained are virtually worthless in creating anything like standard methods.

Etiology: We must confess that we do not know what the etiology of influenza is, and though one worker may succeed in convincing himself, he will find a large number of others, just as competent observers, who will hold an entirely different opinion. Pfeiffer's work carried conviction to the greater part of the medical world when he published his results, mainly because of his renown and prestige as an investigator and as a bacteriologist, and while no one would express a doubt that the diphtheria bacillus is responsible for diphtheria, a discovery by Loeffler, which will stand for all time, the pre-eminent role of the influenza bacillus has been seriously questioned in this last pandemic. Even Pfeiffer himself seems to be somewhat in doubt. On the other hand there are many, and especially workers in the Kitasato Institute in Japan, who still cling to the validity of Pfeiffer's original discovery. It is noteworthy that its occurrence in lesions has been more frequently reported, with improvement in technique.

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INFLUENZA

There seems to be a certain tendency to account for these discrepancies, partly on the grounds of imperfect individual observation, partly on the supposition of a special virulence in the strain, and this idea of strain, type, subspecies, or individualization, among the pathogenic organisms has received more attention during the influenza than ever before, perhaps because there were no adequate grounds forthcoming on which to base a conclusion.

What is regarded as a weak spot in the theory that the influenza bacillus is the primary cause of influenza is that it fails to fulfill the postulates of Koch. By this is meant that when the germ is inoculated into lower animals it does not produce the disease as seen in man, and, of course, not producing it, it cannot be recultivated from the lesions. It must be admitted that there are claims to the contrary, but whether or not this be the case, it does not appear absolutely necessary that such a proof be produced. For example, no one has made the leprosy bacillus conform to the postulates, nor has the gonococcus ever produced a typical urethritis in any lower animal, and the fact that in this case Bumm had to replace the experimental animal with man is a plausible reason against the necessity that lower animals show a typical infection. Even this would not be open to any special discussion were it not for the fact that efforts to infect man himself have signally failed. It is only necessary to draw attention to the results obtained by Rosenau. These are both curious as well as contradictory; curious, in that with what appeared to be virulent material, he never succeeded in a single instance in producing a case of influenza, and contradictory, because the methods which he pursued were analogous to modes of infection which practically every one concedes are the only possible ones.

The question of a filterable virus has received some support from the work of the French and English workers, but certainly not enough

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to substantiate any particular claims. Moreover, they lack verification, and however much these investigators may be convinced of their value, they have not come under the test of independent and unbiased experimentation. The fact that filtered blood and sputa produce similar lesions in animals, hardly holds good in the face of Rosenau's work. It is quite reasonable to suppose that bacteria growing in the mouth cavity and especially in the sputa may produce toxins as well as enzymes which partially disintegrate the protein molecule, and these when injected would, beyond a doubt, bring about toxic symptoms which could be construed as evidence of infection. In this respect the influenza bacillus has been demonstrated to produce toxins, though of a very temporary nature.

On account of the similarity between the lesions of influenzal and plague pneumonia, and also because of the severity of the infection, the plague bacillus, or some member of the hemorrhagic septicemia group, has been suggested. It has even been supposed that an alternation product in the life cycle of the B. pestis might have been the cause. Nothing sustains this theory beyond a few minor observations without conclusive proof. Suggestive is, however, an article of a more or less sensational kind which appeared in the Washington Post, describing the cure of a case of influenza with plague serum. Newspaper science, however much it is based on authenticity, is usually tinged with the emotionalism of an irresponsible reporter and is not to be accorded serious consideration.

Besides the influenza bacillus, the filterable virus, and the plague bacillus as the primary cause of influenza, we have a heterogeneous collection of other germs, among which the hemolytic streptococcus, the diplostreptococcus, and the so-called pleo or polymorphic bacilli have a place. Again we encounter a paucity of evidence to support the discoverers' claims.

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INFLUENZA

Thus the arguments for and against the etiology of influenza per se, stand at the present moment, and in view of the lack of material for proper investigation, it appears probable that the further, and perhaps final elucidation of the cause, will have to await the coming of another epidemic.

With regard to the secondary invaders which bring about the pulmonary complication, there is far less division of opinion. There seems to be no doubt that the original virus paves the way (possibly by reducing potential resistance, vide the invariable leucopenia), for the invasion of the lungs, by organisms which normally, at least very frequently, occur in the oral cavity.

As a repository for infectious material of relatively low virulence, the tonsillar crypts are of paramount importance. No doubt the adenoid tissue of the pharynx plays a part, though a minor one, as well. With a lowering of vitality, or with lesions in the mucous membrane, the margin of safety is reached, and these organisms of relatively low virulence under ordinary circumstances are enabled to multiply and to invade the tissues. With the opportunity for passage through several human beings, the virulence is still further increased until we soon have them attacking normal individuals without there being any primary infection necessary to account for the lowered resistance. This is conceivably the case with influenza bacillus; it is hardly to be doubted that it is with the streptococci, especially the hemolytic variety, the pneumococci Type I to IV, and occasionally the staphylococcus. One or more of these organisms has been constantly found in the pulmonary lesions secondary to influenza, and must, therefore, be accepted as the cause of these.

A point which seems not to have received notice, is the purely mechanical feature of the ciliated epithelia of the trachea and bronchi. These cilia ordinarily prevent microorganisms from penetrating into

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the finer air passages by expelling the mucus and the bacteria toward the larynx. Beyond a doubt poisons paralyze these cilia, and it is quite probable that the toxins of the primary influenza invader nullify the protective action of this natural barrier to such an extent that the streptococcus, pneumococcus, and other organisms pass through the larynx, and finally reaching the bronchioles and air sacs, localize themselves in the lung tissues.

The pneumonia which sometimes follows an ether anesthesia, may in part be due to the action of the anesthetic on the cilia, and not so much to the "irritation," or to aspiration of mouth and throat mucus as is ordinarily supposed to be the case.

Treatment: In view of the fact that we are entirely at a loss to designate with certainty any microorganism as the cause of influenza, we are inevitably compelled to follow the time-honored procedure of symptomatic treatment for its alleviation.

The usual precautions, rest in bed, plenty of air, cleanliness, disinfection of utensils, bedding, clothing, dejecta, etc., are merely the routine measures which experience has shown to be excellent safeguards both for the health of the patient as well as for the protection of those around him, in all forms of infectious diseases.

With medication there is something of a variety which approaches the "hit or miss" therapy of the prepharmacological era. In general it may be said that with influenza, as with most every other disease, the fewer and simpler the medicines and drugs the better the ultimate results. The greater number of practitioners and clinicians have applied this principle in their methods of treatment, though it does not mean that special drugs, such as hexamethylenamin, pituitrin, epinephrin, and others, shall not be used when occasion demands, but that they shall not be given as part of a routine treatment.

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INFLUENZA

The majority agree fairly well that plenty of liquids, especially lemonade, bowels loosened with a cathartic such as salts, or cascara, and probably a salicylate such as acetyl-salicylic ester (aspirin) constitutes about the best routine medication for influenza itself. Some give citrates, as diuretics, and possibly to decrease acidosis, for which bicarbonate of potash may also be used, and pyramidon, phenacetin, or acetanilid for headache. Cough mixtures containing codein, ammonium chloride, ipecac, or the iodides, may prove beneficial.

With pneumonic symptoms developing, digitalis and strychnine play a prominent part, together, of course, with stimulation of the emunctories. Mustard plasters on the chest wall may or may not be of benefit. With failing pulse, epinephrin, transfusion, atropin (the latter especially in pulmonary edema) may help.

The idea of giving opiates appeals to the great majority of the medical profession. It would, however, appear to be distinctly harmful, except in case of great pain, to administer anything other than hypodermic injection of morphine. The main principle to be kept in mind is that of elimination, at least trying to help the body to eliminate the toxins as rapidly as possible through the skin, the bowels, and by way of the bladder, in order to permit the tissues to react in the formation of antibodies. Dover's powders are antagonistic to proper elimination. There appears to be no reason to specially regulate the quantity of the diet, though the quality should be restricted to easily digestible foods.

Convalescent serum, and whole blood citrated, seem to hold out some hope in desperate cases of pneumonia or of influenza during pregnancy. Possibly the vaccines, simple and polyvalent, and foreign protein, possess some advantages. The difficulties of obtaining and preparing the serum and the blood, however, limit their usefulness, and the value of the vaccine may depend on the same power

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to stimulate antibody formation as does the foreign protein, and not on any specific action. Specific serums for streptococcus and pneumococcus have their place in the therapy, but again we have strain or type phenomena to deal with in their general application. If it were generally convenient, or practicable, to isolate and identify the predominating strain, or type of streptococcus, or pneumococcus, as it would possibly be in a properly equipped hospital, and then to give the serum, or vaccine, for that type of strain, we might expect results. A polyvalent pneumococcus serum, however plausible in theory, does not appear to have played a conspicuous part in the therapy.

Prophylaxis: It is generally assumed that as influenza is communicable from person to person, either by contact or by droplet infection in expired air, general closing orders forbidding the congregation of numbers of persons in enclosed and poorly ventilated spaces, would prove to be the most efficacious universal measure against the spread of influenza. Beyond a doubt it has been of paramount assistance in stamping out the epidemic, though there are opponents to this regulation. One observer claims that the closing of theatres, movies, and saloons was only of value because it gave people more opportunity to sleep, and that by sleeping they recuperated their wasted energies, and thus warded off infection. Others have said that it made no difference whatever, and that it was better for persons to be in well ventilated buildings than to stay at home with some infected member of the family. Another point made against it was that to be consistent, all places where people come together of necessity and not for pleasure, should also have been closed. This includes the department and other stores. Business which is of more vital importance than human lives, of course, would not stand for this in some localities, and neither would the saloons, so that how-

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ever feasible in theory, the practical application of closing regulations was to a certain extent rendered illusory. It was not with the lack of will on the part of the authorities to do the proper thing, but rather with their lack of power, and with public inertia, that the difficulty lay.

Isolation and quarantine were only applicable to a degree limited by the extent of the epidemic, and it was inexpedient and impossible to apply them to any great numbers of persons. The most that could be done was to intern those who, as irresponsible and indifferent disseminators of infection, would become menaces to the public welfare.

The question as to whether face masks were, or were not, of value as part of the general prophylaxis, received a great amount of attention and was the subject of some serious investigations.

The research work appears to have yielded confirmatory results which are in accord with the theory, though reports from many sources show, or seem to show, that actual facts were not always in accord with the theory. However convincing this work apparently is for self-limited diseases, such as measles and diphtheria, which at the worst are never as widespread as influenza, this evidence is no criterion of their usefulness on a large scale among an uneducated, indifferent, and careless public. That they were not should not discredit the mask when properly used by nurses and physicians who would be expected to have some fundamental understanding of its purpose. But even here we have a diversity of opinion, and the general tendency does not seem to regard the mask as being of any, or at least of very little, protective value. At this point another observation was introduced which seems, in a measure, to explain the failure of face masks. This is the discovery, or rediscovery, that the conjunctival and the lachrymal ducts may be the collecting ground and port of entry for pathogenic organisms. By the time this fact

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was appreciated (though it seems to have been recognized during the Manchurian epidemic of pneumonic plague), the influenza epidemic was over, and few observations could be made.

Last, and not the least important prophylactic measure, is the vaccination against influenza. Under this heading, for obvious reasons, there are few reliable statistics. The tables and statistics published by Rosenow in the American Medical Journal, on account of the comparatively large number of data, are at least highly suggestive, if not convincing.

The proof for, or against the efficacy of a polyvalent vaccine, such as that prepared by Rosenow, is not acquired within six weeks. It must stand the test of much longer periods of time in the hands of those who are accustomed to the use of such therapy, and who moreover have not only the interest in collecting data, but the ability to draw conclusions from the results which they obtain. Furthermore, they must have the clinical material, and the experience and judgment in administering the vaccine. Once more we may simply have the stimulation of normal antibodies by a foreign protein, and not a specific protective reaction against the invasion of the influenza virus.

That immunity is not conferred by an attack of influenza is generally thought to be the case. Immunity is, however, a relative term dependent on time, so that in assuming that an immunity to any disease is, or is not developed, it is necessary to state also the period during which this immunity prevails. That persons for one reason or another not apparent to themselves, have escaped without an attack of influenza during the epidemic, may mean either that their environment was not suitable for the acquirement of infection, that their mucous membranes were not pervious to the virus, or were not suitable culture media, or as doubtless occurs in every epidemic, they were *naturally* immune. It does not signify that because some persons

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suffered repeatedly that others did not develop immunity, it simply means that the former did not develop sufficient antibodies, and they appeared to be so numerous simply because of the very great incidence of the disease. Repeated attacks are known to occur with those infectious diseases, one attack of which usually confers immunity for life, for instance smallpox and scarlet fever. These second attacks are rare simply because smallpox and scarlet fever never prevail, and probably never have prevailed to the extent that influenza did during the great pandemic. Thus, in spite of the general opinion, it is hardly conceivable that at least a short period is not conferred, otherwise as has been pointed out elsewhere in this report, there would be no reason to try to produce a vaccine against influenza. But a more cogent reason still, and one which would seem should be in accordance with common sense, is the very fact that the epidemic after raging in a locality "burns itself out." Such surely would not be the case were there not some sort of an immunity produced, otherwise we might expect people to have one attack following another, without the disease becoming virtually extinct within a limited time, as it actually did. Opinions by a number of observers to the effect that this is the case, have been cited in the text of the report.

To the question whether influenza will recur again in pandemic, or epidemic form, there is no answer to make one way or another. We learn nothing from the history of pandemics, such as for instance the plague, which reappeared periodically during the Middle Ages, as the great scourge and curse of Europe and Asia, because we live in a different era. That plague and leprosy have all but disappeared from the European countries is, however, not because the people were immunized, but because they changed their habits of life and became civilized.

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THE MEDICAL INTERPRETER

INFLUENZA

The principles of Hygiene and Preventive Medicine, and above all an enlightened and intelligent section of the public, willing and eager to co-operate with health authorities, have been, and will continue to be, the best safeguards of Public Health. It is from these devoted men, who will wisely "learn from the past to prepare for the future" that we must expect the proper answer to the question when the emergency arises.

Surg.

INTESTINAL OBSTRUCTION

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In the treatment of intestinal obstruction, whether acute or chronic, the surgeon must always be prepared for surprises, for there is probably no other department in the whole of surgery where the diagnosis of the underlying cause is so difficult to foretell. This is easily understood when one considers the manifold possibilities for mischief within the abdomen. Apart from purely intrinsic causes, the bowel may be impeded in its functions by many conditions of intrinsic origin. To enumerate these would take a long time, and I do not propose discussing them, since after all the exact diagnosis of the causal factor, in the vast majority of cases of intestinal obstruction, is only of academic importance.

Some time ago I reviewed the numerous cases of intestinal obstruction that had come under my observation. They included many cases of exceptional interest, and, on summing up the series, it was rather surprising to find that in many instances the exact cause of the obstruction was only revealed at the operation. From the series I have chosen four cases to illustrate the difficulties with which one may have to contend, both in diagnosis and operative treatment. Two of the cases came under the care of Sir A. Mayo-Robson while

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I was his assistant, and I have to thank him for permission to record them. The other two occurred in my own practice.

CASE 1. *Acute angulation at the hepatic flexure from pericolitis; rupture of the taeniae coli of the caecum.*—The patient was a man, aged 62, who for some years had suffered from mucous colitis. On a recent visit to South Africa and Egypt he had been very ill from dysentery. When seen by Sir A. Mayo-Robson the patient complained of pain and discomfort in the lower abdomen, and stated that he was passing undigested food and mucus. The bowels were acting irregularly, and the patient noticed that with a morning action he had abdominal discomfort for the rest of the day. There was much less pain when the bowels acted in the evening, and he was always better when constipated. The patient came into a nursing home and the rectum and sigmoid were examined by the sigmoidoscope, but beyond undue redness and hypertrophy of the mucous membrane nothing abnormal was detected. Two days later he was suddenly seized with acute griping pain in the right iliac fossa, accompanied by marked distension in that region. There was some collapse, followed by slight rise of temperature and pulse-rate, and in the evening by vomiting. The distension was relieved by enemata, so next morning operation was decided on. Up till now the symptoms pointed more to appendicitis than to anything else. When the abdomen was opened a remarkable condition was revealed. The caecum was enormously distended and very inflamed, and at its junction with the ascending colon there were two transverse slits, each about an inch long, involving the peritoneal coat and the anterior and internal taeniae coli. The circular fibres were intact, but the divided ends of the longitudinal bands were one-third of an inch apart. The abdominal incision was enlarged when the ascending and about five inches of the left part of the transverse colon were found bound

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together by adhesions, so that the general appearance resembled that of a double-barrelled shot-gun. These adhesions were confined to the wall of the gut, and did not extend to the peritoneal lining of the abdominal wall. At the hepatic flexure extreme angulation had been produced. The adhesions, some of which were very dense, were carefully separated, and the raw surfaces left were stitched over with fine chromic catgut. When the fused portions of the bowel were ultimately freed a few reefs were taken in the transverse mesocolon so as to bring this part of the gut into better line. The divided taeniae coli were then sutured and the appendix which was tortuous and somewhat distended, was removed. The abdomen was then closed. The patient made a good recovery, and obtained great relief from the operation. Two and a half years later he was still passing some mucus in the stools, but the abdominal pain had quite disappeared.

Similar cases of obstruction of the large intestine have been recorded, notably by Jackson, Pilcher, Arbuthnot Lane, Mayo, and Gerster, but this case is probably unique in that, added to the acute angulation at the hepatic flexure, two of the three taeniae coli were ruptured. As these bands are shorter than the tube itself and keep the wall of the colon puckered, they were the first to give way during the acute distension of the caecum. If the obstruction had not been relieved by operation the partial rupture would, doubtless, have extended and probably become complete. Much has been written on the etiology of these constraining bands and adhesions, but this case seems to support Pilcher's view that they are the results of long-continued or oft-repeated mild infections of the peritoneal covering of the caecum, colon, and appendix transmitted through the intestinal wall. Nowadays the extreme angulation would have been recognized by radiography after a bismuth meal, but at the time when the patient was under treatment that diagnostic method was in its infancy.

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INTESTINAL OBSTRUCTION

CASE 2. *Polypus of the ileum accompanied by a chronic intussusception.*—The patient was a woman of 65, who for some months had been subject to recurrent attacks of pain in the right lower quadrant of the abdomen. These attacks had become more frequent and were usually accompanied by vomiting, abdominal distension, and constipation. The vomit was always bile-stained at first, but soon became foul, though never fecal. A swelling was ultimately detected in the hypogastrium, so operation was advised. When the patient consulted Sir Arthur Mayo-Robson the swelling was smooth and ovoid, and was about three inches long. It was situated in the hypogastrium, to the right of the middle line, and was freely mobile. A diagnosis of tumor of the small intestine, probably malignant, was made. At the operation the tumor was found in the ileum, six inches from the ileo-cecal valve, but in addition there was a chronic intussusception immediately above. The intussusception was about two inches long and the various layers were much hypertrophied but not discolored. During the reduction, which was easily performed, the tumor remained stationary; it was not attached to the apex of the entering layer, as is generally the case. Careful examination then revealed the fact that the growth was a polypus attached to the anterior wall of the ileum, midway between the mesenteric and free borders, so the bowel was opened by a longitudinal incision and the tumor delivered through it. It proved to be a large polypoid growth with a short, narrow pedicle. The latter was ligatured and divided and the bowel incision then closed by two continuous catgut sutures. The patient made a straightforward recovery and, happily for her, the polypus turned out to be of a simple character—an adenoma, with a good deal of fibrous stroma.

Single polypi of the small intestine are uncommon and in adults are often malignant. Not infrequently they produce intussusception,

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the polypus being found at the apex. In this case it was different. The intussusception was situated above the tumor and only the large size of the latter prevented the invagination from passing further down the bowel.

CASE 8. *Acute intestinal obstruction from traction diverticulum of the ileum.*—The patient was a man of 44, who had enjoyed good health until twelve years before, when he began to have recurrent attacks of abdominal pain, accompanied by vomiting. The pain, which was always of a griping nature, commenced behind the umbilicus and did not radiate. After a lapse of 12 to 18 hours there was profuse vomiting of bilious fluid. These attacks of sickness lasted for 24 hours and were sometimes relieved by taking a large dose of aperient. The griping pain usually subsided in three to four days. During each attack there was considerable abdominal distension. Ten years before I saw him (i. e., two years after the commencement of the recurrent attacks of pain and vomiting), the patient underwent an operation for acute appendicitis with abscess. The appendix was removed and the abscess drained. A weak scar resulted and the symptoms of pain and vomiting were not relieved; in fact, they became more frequent.

I first saw the patient with Dr. J. Henderson during one of these attacks, which had commenced 48 hours previously. Large quantities of bile-stained fluid were being vomited, and the abdominal pain was very severe. There was some general distension of the abdomen, and active peristalsis of coils of small intestine was plainly visible. I diagnosed obstruction of the small intestine, and advised that the abdomen be opened through the long weak appendectomy scar, for I considered that adhesions resulting from the appendicitis might be the cause of the trouble. The patient was removed to a nursing home, and I operated the same afternoon. The

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weak scar was excised and the cecum found attached to the anterior abdominal wall by some frail adhesion. It was, however, collapsed, so it was freed and search made for the obstructed part. The lower ileum, which was also collapsed, was rapidly examined from below upwards. About six feet from the ileo-cecal valve the bowel was acutely kinked from a traction diverticulum. The diverticulum was about two inches long and was adherent at its apex to one of four calcified lymphatic glands near the root of the mesentery. On freeing the diverticulum the kink immediately straightened out. The diverticulum appeared to be composed of all the coats of the intestinal wall, somewhat attenuated at the apex, but as it spontaneously contracted when it was freed I did not excise it, but contented myself with burying it by means of a purse-string suture. As the patient was very ill I did not spend time in removing the glands. A rapid repair of the weak abdominal scar was then performed and the abdomen closed. The patient obtained immediate relief from the operation and made an uninterrupted recovery.

Traction diverticula are of rare occurrence, but they have been found in all parts of the alimentary tract. They are small funnel-shaped pouches, produced by retraction of chronic localized peritonitis, by cicatrices in the wall of the intestine itself, or by imflammatory processes in adjacent organs. Adhesion of the bowel wall to a tuberculous lymphatic gland is one of the commonest causes. As Treves points out, mesenteric gland disease may lead to intestinal obstruction in various ways. The local peritonitis in the serous membrane covering the glands may produce adhesion of bowel or omentum, or may encourage the development of bands which may in turn cause intestinal strangulation. Or, again, the local peritonitis may lead to adhesions between the two limbs of a loop of intestine or between two remote parts of the intestinal tube. In Hilton

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Fagge's case the sigmoid was found adherent to the ileum and in the angle between the two attached portions of the gut was a caseous gland. In other cases the shrinkage of the mesentery after extensive gland disease was so pronounced and produced so much distortion as to cause obstruction of the adjacent bowel.

In the case which I have just described it is probable that the bowel became adherent to the gland early in life, and that the diverticulum formation was a slow process produced by sagging in the intestinal loop. Obstructive symptoms appeared when the traction was sufficient to cause kinking of the gut.

CASE 4. *Strangulation of a loop of ileum by an adherent appendix epiploica of the sigmoid.*—The patient was a woman of 64, whom I saw in consultation with Dr. Edward Gregg. Two nights before, she had been suddenly seized with severe pain in the lower abdomen, followed by profuse vomiting. Opium was given to relieve the pain and sickness. The patient was seen by Dr. Soltau Fenwick, who found a tense swelling in Douglas's pouch. He diagnosed pelvic peritonitis and advised immediate operation. I saw the patient when she had been removed to a nursing home. The abdomen was rigid and tender but not distended. The tongue was furred. Pulse 120; temperature 100° F. On opening the abdomen by a subumbilical incision the pelvis was found filled with blood-stained fluid. This was quickly mopped up, when a coil of gangrenous small intestine presented in the wound. On passing the hand into the pelvis this gangrenous loop was found tied down by a band passing from the lower part of the sigmoid flexure to the bottom of the pouch of Douglas. The band was clamped, divided, and ligatured. As the proximal ligature was being passed, the band was examined and proved to be an attenuated appendix epiploica. The obstructed loop was now easily brought out through the incision. The ensnaring

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INTESTINAL OBSTRUCTION

band had formed a marked constriction in the bowel wall and mesentery, but the gut above was not much distended, so I decided to excise the gangrenous loop and perform an end-to-end anastomosis. This was quickly done and the abdomen closed, a drainage-tube, passing down to Douglas's pouch, being left in the lower end of the wound. The patient made a splendid recovery, and the incision healed without any suppuration.

Many such cases of intestinal strangulation by appendices epiploicae have been recorded. In Hulke's case an epiploic appendage from the sigmoid flexure was attached to the pelvic peritoneum near the right sciatic notch, and beneath the arcade so formed a loop of bowel had been strangulated. In another case, described by Holmes, an appendix epiploica formed a fatty fibrous ring around a loop of the lower ileum. As to what caused the adhesion of the appendage to the pelvic peritoneum in my case it is impossible to say. At first I thought I was dealing with a case of sacculitis of an epiploic appendage, but on examination there was no evidence of this. The appendage was long and fibrous, and did not appear to be patent. In sacculitis the appendage is usually hypertrophied and fatty, and often has a bulbous tip in which fecal material becomes lodged and produces inflammation.

Med.

IRIDO-CHOROIDITIS

Fixation Abscess in Irido-Choroiditis and Sympathetic Ophthalmia. (L'abcés de fixation dans l'irido-choroidite et l'ophtalmie sympathic.) Dr. Van Lint. Arch. d'ophtalmol., Paris, No. 10, 621-625.

The French physicians make extensive use of the fixation abscess, especially in pneumonia and puerperal infection. In diseases of the eye it has never been used until the author tried it and obtained good

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results. He first applied this treatment in 1913 in the case of a woman who had irido-choroiditis with corneal complications. All the usual treatments had been of no avail. He then injected 1 c.c. of oil of turpentine under the skin of the forearm. (The injection could not be made on the thigh because the patient could not stay at the hospital.) Eight days later the abscess was incised rending a great quantity of pus. At the end of two weeks the abscess was completely cicatricized. The eye trouble was completely cured and vision was restored. In another case of irido-choroiditis, in which all remedies failed and vision was reduced to one-sixth, he made a fixation abscess resulting in a complete cure.

The author cured a number of other cases of irido-choroiditis by producing an artificial abscess on the thigh or in the abdominal wall. The same method of treatment was completely successful in four cases of sympathetic ophthalmia. Two cases received the injection of turpentine at the time the sympathizing eye was enucleated, the two others a few weeks after the enucleation, which had exerted not the least favorable action on the development of the sympathetic ophthalmia. In all four cases the inflammatory process decreased rapidly, the iris was freed and the pericorneal injection disappeared.

The technique is simple. One c.c. of the oil of turpentine is injected under the skin of the abdomen or of the thigh. In a few days an aseptic abscess forms. Slight fever follows. The pain is less when the abscess is made on the abdomen than when produced on the thigh. On the seventh day the abscess is incised.

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Med.

JAUNDICE

A Meat Diet in Jaundice. (Le régime carné dans l'ictère.) Dr. P. Chevallier. Presse médicale, Paris, No. 48, 477.

Jaundice, even after a cure, leaves frequently a great mental depression in the patient. A meat diet prevents this and the patient feels cured and well long before the discoloring of the skin has disappeared. But the patient is usually averse to taking any kind of food. He is therefore given at first gradually increasing quantities of milk from which the cream has been removed. The milk diet counteracts the accumulation of toxic substances in the intestine, increases diuresis and diminishes the toxicity of the intestinal contents. As soon as the patient can take solid food without nausea he is given a small quantity of roast or beefsteak. This is gradually increased to 100 or 200 c.c. The patient soon regains his appetite which becomes even voracious. But before a complete cure is effected bread is strictly forbidden.

Med.

MALARIA

Adrenalin Injections in the Diagnosis of Latent Malaria. (Le iniezioni di adrenalina per la diagnosi di malaria latente.) Dr. A. Dazzi, Policlinico, Roma, sez. prat., No. 48, 1413-1417.

There are malaria patients who do not show the typical attacks and an examination of the blood is frequently without results. The symptoms in such cases consist in splenomegaly, oligemia, urobilinuria, slight fever, gastro-intestinal disturbances, rheumatic and neuralgic pains, chronic headache, etc. The diagnosis is difficult as the condition simulates other diseases.

In order to be able to make an exact diagnosis from the examination of the blood Dr. D. used subcutaneous injections of adrenalin.

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MALARIA

All quinine treatment was stopped five days before the injection. One milligramme of adrenalin was administered subcutaneously. After the injection the temperature began to rise slightly, but there was no typical malarial attack. While before the injection the plasmodium could not be found in the blood the malarial parasite was present in the peripheral blood one hour after the injection. The presence of the parasite in the blood lasts only for a short time. The plasmodium begins to appear twenty minutes after the injection, it is most numerous one hour after and disappears twenty-four hours after the injection. Dr. D. applied this diagnostic method in twenty cases and in all obtained positive results. As an incidental effect of the adrenalin injection he mentions a marked reduction of the enlarged spleen.

Med.

MALARIA

Combined Quinine-Methlylene Blue Treatment of Malaria. (Ueber kombinierte chinin-Methylenblautherapie der Malaria.) Dr. R. Reitler. Wien. klin. Wochenschr., 1920, XXXIII, No. 1, 9-12.

Forty-four cases of malarial fever were treated with small doses quinine combined with methylene blue. The patients received twice daily 0.25 g. of quinine and 0.5 g. of methylene blue. In all cases the malarial attacks were prevented and the parasites in the blood disappeared rapidly. The fact that in the treatment of such cases a smaller dose of quinine is needed is important for the treatment of quinine-resisting cases and especially of black-water fever. But the method is also of value in cases which are not markedly quinine-

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resisting, especially when the intravenous application of quinine or salvarsan is contraindicated.

Med.

MALARIA

The Value of Intramuscular Injection of Quinine in the Treatment of Macedonian Malaria. Maj. H. W. Wiltshire. Jour. Roy. Army Med. Corps, London, No. 3, 251-261.

Intravenous and intramuscular injections of quinine in the treatment of malaria have been objected to as possessing elements of danger and as not being superior to the oral administration. But from the experience of Maj. W. this does not hold good with regard to intramuscular injections. In Macedonia he met with a most severe type of malaria, the majority of cases being of the malignant variety, and intramuscular injection of 20 grains twice daily proved very successful. A 50 per cent. solution of quinine hydrochloride was used. This was sterilized in an autoclave three days in succession before issue and again every morning when used. Repeated heating does not detract from the therapeutic value. In malignant tertian malaria intramuscular quinine injections give a distinctly better prognosis of life than the oral administration. They reduce fever and alleviate all symptoms far more surely.

The great obstacle in trying to effect a cure of malaria is the persistence of living parasites in tissues such as the spleen and bone-marrow where, for some reason, they are immune from quinine. In the early stages before they invade these tissues, every case of malaria can be cured in a week by the energetic administration of quinine, but later the extermination of the parasites becomes increasingly more difficult. There is reason to believe that intramuscular quinine is more lethal to spleen and marrow parasites than the oral administration.

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MALARIA

Malarial Cachexia and Splenic Opotherapy. (Cachessia malarica ed opoterapia splenica). Dr. E. Di Poggio. Med. pratica, Napoli, No. 4, 89-92.

While the spleen is considered a hematopoietic organ, Koelliker and others have shown that no red cells are formed in the spleen, but that leukocytes are changed into erythrocytes. But the spleen has also the power to form lymphocytes and leukocytes. This takes place chiefly in the Malpighian bodies. Furthermore, Danilewski has demonstrated that the spleen contains an internal secretion, a specific substance which, if injected into the animal body, has the power to increase the hemoglobine and the number of red cells. It might therefore be expected that splenic extract would have therapeutic value.

Dr. Di Poggio used splenic extract in two cases of malarial cachexia. He employed for this purpose endosplenine, a preparation made from ox and sheep spleen by the Milan Serotherapeutic Institute. He injected every other day 10 c.c. of the extract into the buttocks and continued this treatment for twenty days. The results were most satisfactory. In both cases the number of red cells was about 3,000,000 and that of the white cells 9,000. After the treatment the red cells had increased to 4,000,000 and the leukocytes to 11,000. The author concludes that the internal secretion of the spleen must have a powerful stimulating effect on blood formation. The intravenous injection of endosplenine lowers arterial tension, but this effect is harmless according to the author's experience.

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Med.

THE DIAGNOSIS OF MALARIA

Graham E. Henson, M. D. Jacksonville, Fla.

There is probably no disease easier of diagnosis than the malarial fevers, and probably few that so easily confound many physicians even of good repute. The pernicious habit of attributing all ills having as prominent symptoms "chills and fever" to the malarial fevers is too common even today, while on the other hand it is not uncommon to attribute malarial infections to other diseases.

Deaderick well states that "Malaria is the scapegoat of tropic pathology and quinine the high priest. Too often is the mocking equation of Legrain fever=malaria=quinine employed to solve the diagnostic problems of the fevers of warm climates."

Manson writes—"There is a marked tendency to regard and diagnose all fevers occurring in tropical countries, or in individuals who have returned from tropical countries, as malarial. Such slovenliness in diagnosis must be strenuously avoided by the practitioner. It is apt to become a habit which, sooner or later, is bound to have disastrous consequences." Even today these terse statements made some years ago are only too true.

Not only the successful treatment of the malarial infections but the control and eradication of the disease is so dependent upon the proper recognition of the disease that in this article we will review some of the more recent writings on the diagnosis of these infections and the pitfalls that are in wait for the unwary.

It is not considered necessary to dwell on the typical clinical symptoms upon which there is reasonable ground to suspect a malarial infection.

Craig emphasizes the fact that it is only in the most typical cases of malarial fever that we are able to arrive at a diagnosis from the clinical symptoms alone, and lays stress on the laboratory diag-

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nosis of the disease. He goes so far as to believe that the time will come when failure to examine the blood of a fever case will be considered malpractice, and that a physician, losing a patient by death and not recognizing the disease, will be liable to prosecution. The diagnosis by laboratory methods is discussed at length, it is recognized that in typical cases a diagnosis by clinical symptoms may be reached, while the so-called therapeutic test by the administration of quinine is dismissed, as it deserves to be, with a few lines, this author very properly taking the position that while the fever if of malarial origin will disappear under the administration of this drug, that there is no certainty that malaria was the fever-producing factor, as many fevers will disappear under any treatment or under no treatment at all. It is not to be inferred that quinine should never be employed until such time as a microscopical diagnosis is arrived at, or that the pernicious and, if left alone, early fatal cases should await a microscopic diagnosis before treatment is instituted. Deaderick writes: "There are theoretic and ultra-scientific writers, apparently valuing a microscopic diagnosis more highly than human life, who advocate withholding the specific indefinitely until the parasite may be found. On the other hand, there are physicians who continue the administration of quinine in heroic doses for days, or even weeks, in fevers which do not show the slightest susceptibility. . . . A fever which resists quinine is not a malarial fever. In order to test the resistance of a fever to quinine the drug must be continued for a sufficient length of time and in proper doses at suitable intervals, and what is most important, it must be absorbed. The maximum period of resistance of malaria to quinine is ordinarily stated as four days. As far as the writer's observations go, they tend to show that in many cases the fever is broken by the end of thirty-six hours, in at least half the cases in forty-eight hours, and in three-fourths of the cases in sixty hours."

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THE DIAGNOSIS OF MALARIA

In his discussion of the laboratory diagnosis of this disease Craig emphasizes that while the fresh blood may be examined that the stained preparation renders the plasmodia more easily detected, so that while for those interested in studying the movements and vital phenomena the fresh blood may be employed, the stained specimen should be used at all times when the clinician desires an accurate and a rapid diagnosis. Contrary to a prevailing belief, Craig, together with practically all writers on this disease, emphasizes the fact that as a rule one examination of the blood will be sufficient to establish a diagnosis. He, however, makes it very plain that in some instances frequent examinations may be necessary, although he has never seen a case severe enough to cause clinical symptoms in which it was not possible to demonstrate the plasmodia if persistently looked for. He mentions crenations, retraction of the hemoglobin, vacuoles, areas devoid of hemoglobin, platelets, haemokonien or blood dust and granules derived from broken down leukocytes as objects which may be mistaken for plasmodia in the unstained specimen, while flaws in the slide in which a portion of the stain may collect, blood platelets, vacuoles and leukocytes as such objects in the stained specimen.

Many chapters could be written on the examination of the blood in the diagnosis of malaria. A detailed description of the preparation of the various stains which may be employed is not of practical interest to the active practitioner. In a paper presented before the Southern Medical Association some years ago, was summarized what I consider the practical points covering an examination of blood from a suspected case of malaria.

"For the examination of blood a 1-12 oil immersion lens should be combined with an 8x eyepiece, the microscope should be provided with a diaphragm and condenser, and while a mechanical stage is not absolutely necessary, it is unsatisfactory to attempt work without one.

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THE DIAGNOSIS OF MALARIA

"Having properly cleaned the requisite number of slides by washing with soap and water and drying them, the finger or the lobe of the ear is punctured with a coarse needle, a small drop of the exuding blood is placed on the slide by just touching it to the glass surface without allowing the slide to come in contact with the skin; this, the specimen slide, is now held between the thumb and first finger of the left hand at an angle of about 45 degrees, and the end of another slide, the contact slide, held in the right hand is rested on the drop of blood when the blood will flow by capillary attraction to the outer edge of the specimen slide. The contact slide is now moved, using light pressure, upwards along the surface of the specimen slide, which will result in a thin, even smear. After this has dried it is stained with any of the suitable stains; I prefer and have used with success Wright's which stains the erythrocytes a light pink or straw, the protoplasm of the parasites a light blue, the pigment a light brown to a black, while the leukocytes appear with the nuclei stained a deep blue, the protoplasm a light straw.

"I would lay a special significance on the differential leukocyte count, for with the detection of an increase of the large mononuclears and an absolute count showing a leucopenia we have arrived at two very significant diagnostic points, even in the absence of parasites, and in the event that quinine has not been administered a careful and persistent search will generally be rewarded by finding the parasites sooner or later as I have demonstrated to my satisfaction time and again.

"The thick film method originally suggested by Ross, and which has since been modified by Ruge, James, myself and others, is of especial value for the detection of the sexual forms and the older schizonts. While the method may be used for diagnostic purposes in acute malaria it is of more value in those chronic cases where the

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parasites are few and in which the more fully developed parasites and sexual forms are to be found but are few in number. For the technique of this method I will refer those interested to the various monographs that have been previously published, but would state here that care must be taken not to make the film too thick and to caution that a reasonably even smear be obtained."

Deaderick discusses the diagnosis of malaria from the three standpoints—symptoms, the examination of the blood, and the effect of quinine upon the symptoms. He considers tertian and quartan periodicity as pathognomonic of malaria, but quotidian periodicity as not only worthless but misleading in the diagnosis of the disease. He refers to the so common error familiar to all engaged in tropical medicine of cases of abscess of the liver being drenched with quinine in the belief that malaria was responsible for the rhythmic quotidian succession of chill, fever and sweat. He discusses the several factors which influence the result of examinations of the blood of individuals suspected of having malaria, laying special stress on the previous administration of quinine. So frequently physicians will start the administration of quinine having been satisfied from a clinical standpoint they are dealing with a malarial infection only to later make an effort to establish this diagnosis by the detection of the organisms in blood smear preparations. The effect of even a small dose of the quinine salts is to dry the malarial parasites from the peripheral circulation, so that what would in the majority of cases be an easy test is made at the best a most tedious and laborious one. The other principal factors having influence on such blood examinations discussed by Deaderick are the stage of development of the organisms, the stage of the disease, and the type of infection. In a former publication a discussion of these factors was summarized by myself as follows:

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THE DIAGNOSIS OF MALARIA

"The time at which a smear should be taken is a matter that has received very little serious consideration by the general practitioner, and while parasites at some stage of their growth can usually be detected during the entire cycle, there are times when they are a great deal more numerous in the peripheral circulation than at others, and therefore more easy of detection. In the benign tertian, sporulation occurs, principally in the deep circulation, and the great majority of schizonts seek the deeper tissues a few hours before this cycle is reached, the young merozoites following sporulation do not at once inhabit the peripheral circulation, so that the best time to take blood smears for the detection of the benign tertian parasite is from four to six hours after the chill, and for the succeeding hours to within six hours of anticipated sporulation. In the quartan infection sporulation occurs more often in the peripheral circulation than in other forms of the disease, and on this account the parasite is more easy of detection in the peripheral circulation throughout the entire cycle, so that the timing of taking a smear is not so important. In the estivo-autumnal types, however, sporulation occurs almost entirely in the deep circulation, even the old schizonts being hard to detect in the peripheral circulation; on this account it is important that especial attention be paid to the time the smear is taken. Two hours after the chill or exacerbation, and for the succeeding two or three hours will be found to be the most suitable times to secure smears for the detection of both the estivo-autumnal types of the disease, although after the infection has persisted long enough to allow of the formation of crescents a smear taken at any time will show the presence of these forms."

In considering the differential diagnosis of the malarial fevers first and foremost stands the surgical belly. In 1911 I reported a case of tertian malaria simulating appendicitis, which is so typical

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of cases that frequently present themselves to the clinician that the report is herewith reproduced:

"P. L., white, age 34, carpenter, unmarried, was suddenly seized with a severe pain in the abdomen at 6 p. m., March 15. I reached his bedside three hours later. He gave no history of having had previous attacks. He was in intense agony; the right abdominal wall was rigid, the right thigh flexed at right angles to his body. He had vomited twice previous to my arrival; there was no chill. Light pressure over the appendix elicited intense pain, and any attempt at deep palpation produced great agony. The temperature was 99.2 F., pulse 90. A tentative diagnosis of appendicular colic was made, half a grain of morphine sulphate administered hypodermatically, five grains of calomel administered, all nourishment withheld and a saline ordered for the following morning. The next day, fifteen hours after the initial symptoms, the patient was resting comfortably, but the right rectus remained rigid, and considerable pain was elicited by deep pressure over the appendix. His bowels had been thoroughly moved and his temperature was normal. The patient was warned to remain in bed, to limit his diet to liquids, and owing to the distance at which he was situated and the time involved in a visit to advise me if further symptoms developed. The evening of March 17, I was hurriedly sent for, but being absent did not reach his bedside for some hours. An attendant advised me that he had in the morning become perfectly comfortable, had dressed that afternoon, and left his home. At 6 that evening, a few hours after leaving home, and just forty-eight hours after the initial attack, he was again seized with intense abdominal pain, accompanied by a severe chill. An hour later his temperature had reached 106 F., and he was semi-comatose. I found him some hours later with the abdominal symptoms intensified over those prevailing two days previous. The temperature had, by this

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time, fallen to 101, the mental condition was again clear. While all the subjective symptoms pointed to an appendicitis, the temperature curve was not in accord with such a diagnosis. A blood smear was taken which at daylight I treated with Wright's stain. The first field examined under a 1-12-inch oil immersion lens showed a well developed hyaline ring form of the tertian type; other fields showed numerous tertian parasites in various stages of development. Ten grains of the quinine sulphate with dilute hydrochloric acid were ordered given three times daily. With the second dose an amelioration of the abdominal symptoms occurred, and in twenty-four hours they had entirely disappeared. The patient recovered rapidly under a continuation of the treatment outlined."

Craig, in discussing the differential diagnosis, writes—"The differential diagnosis of the malarial fevers from other diseases is only possible in many instances by an examination of the blood, and this should never be neglected when we are called to see a fever in malarial localities or in an individual returning from such a locality. The difficulty of a differential diagnosis by aid of clinical symptoms alone is especially great in the case of the estivo-autumnal infections in which the appearance of atypical symptoms is common, and in which pernicious symptoms occur which simulate those present in other specific diseases."

Typhoid fever, yellow fever, kala azar, dengue, malta fever, other fevers, tuberculosis, hepatic abscess, ulcerated endocarditis, dysentery, cerebral apoplexy, sunstroke, and leukemia are all mentioned by this author in his discussion of the differential diagnosis of this disease.

Deaderick writes: "The differential diagnosis between the malarial infections can best be made with a microscope. In only one type of infection, the quartan, either single or double, can the differential diagnosis be made clinically with certainty. The differentiation

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THE DIAGNOSIS OF MALARIA

of chronic malaria from cachexia is sometimes very difficult, the relation being one of disease entity and sequel, and the difference sometimes one of degree only"—and then discusses at length abscess of the liver, infective endocarditis, puerperal septicemia, typhoid fever, tuberculosis, influenza, yellow fever, and leukemia.

Without going into minute details concerning the differential points that characterize a diagnosis of malaria as against these various pathological conditions, it may be generally stated that a complete examination of the blood is absolutely essential when a differential diagnosis is under consideration, always bearing in mind that the presence of malarial parasites in the blood, while establishing beyond doubt the existence of malarial infection, does not preclude the possibility that they are only an incidence in the case, and that further study may be necessary to establish a complete pathological picture.

Med.

MALARIA, TREATMENT OF

From Public Health Reports, Under Gen. Rupert Blue.

The following is the report of the Subcommittee of Medical Research of the National Malaria Committee, and may be accepted as authoritative:

The subcommittee on medical research of the National Malaria Committee presents the following as a standard method of treatment of malaria for the purpose of curing the patient of his infection and recommends its general use by the medical profession. We believe that this treatment will, in the great majority of cases, prevent relapses in the patients themselves and also prevent transmission of infection to others. Our opinion is based largely upon the results of the treatment by this method, under average conditions, in their homes, of a large number of persons infected with malaria.

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MALARIA, TREATMENT OF

"For the acute attack 10 grains of quinine sulphate by mouth three times a day for a period of at least three or four days, to be followed by 10 grains every night before retiring for a period of eight weeks. For infected persons not having acute symptoms at the time only the eight weeks' treatment is required.

"The proportionate doses for children are: Under 1 year, ½ grain; 1 year, 1 grain; 2 years, 2 grains; 3 and 4 years, 3 grains; 5, 6 and 7 years, 4 grains; 8, 9 and 10 years, 6 grains; 11, 12, 13 and 14 years, 8 grains; 15 years or older, 10 grains.

"It is not claimed that this is a perfect or even the best treatment in all cases, but it is our belief that it is a good and satisfactory method for practical use to prevent relapse and transmission to other people.

(Signed) "C. C. Bass, *Chairman,*
"William Krauss,
"William H. Deaderick,
"George Dock,
"Charles F. Craig."

Med.

MALARIA AND PREGNANCY

The Relation of Malaria to Pregnancy. B. Kaufman. New York Med. Jour., CX, 1028.

No matter at what stage of pregnancy or the puerperium malaria should appear, quinine should be promptly administered and in sufficient dosage to control the infection. The author states that, in spite of the abortifacient qualities of quinine, its use in true malaria during pregnancy will tend to have the opposite effect. The disease itself, if not quickly checked, will cause abortion. It is, therefore,

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MALARIA AND PREGNANCY

important to demonstrate the presence of the parasites both chemically and microscopically.

Quinine should be continued as a prophylactic measure during pregnancy and the puerperium after a proven case of malaria, even though the infection has apparently been overcome.

The writer does not think that malaria predisposes to eclampsia and also states that a nursing mother can take quinine without any bad effect on the baby, but fever may make the milk injurious.

Ergot used during the puerperium may cause contraction of the muscular coats of the spleen and force parasites in the spleen out into the circulation and thus cause a recrudescence of a latent malaria.

Involution of the uterus is slow in malaria and perineal lacerations do not heal so readily.

Med.

MENORRHAGIA

A Case of Dyscrasic Menorrhagia Cured by Hemato-Ethyroidine. (Un cas de ménorragie dyscrasique arrêtée par l'hémato-éthyroïdine.) Dr. Emile-Weil. Bull. et mém. Société d. hôpitaux de Paris, No. 23, 672-677.

A married lady of about 30 years, without children, suffered from profuse menorrhagia for twenty-five days every month. No utero-ovarian lesion could be found. There was nothing abnormal except a small goiter on the right side, which produced no goiter symptoms. Curettage was without avail. The lady was extremely weak and anemic. All sorts of treatment produced no improvement. At last thyroid extract (hemato-ethyroidine) was administered, three spoonfuls per day. In a few days the hemorrhage stopped suddenly and the next menstruation, which came on three weeks later, lasted only five days. The treatment was now interrupted. Two months

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MENORRHAGIA

later the hemorrhage reappeared. Again hemato-ethyroidine was given daily every other week and the patient was now permanently cured.

Med.

NEPHRITIS, TREATMENT OF

Dr. N. D. Buie, Marlin, Texas.

Nephritis is a time-worn subject like cancer of the stomach. Until a few years ago it seemed that all had been said, but six years ago Rowndtree and Garaghty, then of Johns Hopkins, but Rowndtree now of the University of Minnesota, brought out the phenolsulphonephthalein test for kidney function, which established a new era in kidney investigation.

The old classifications of nephritis were either based upon symptomatology or pathology; in the works and literature for the future classifications, kidney diseases will be based upon symptomatology and *function, more especially function* and kidney function as worked out by the new methods of blood chemistry in which an accurate estimate is made of the retention products found in the blood which should normally be eliminated by the kidney. Another good and very comprehensive classification is that of Rowndtree and Volhard and Fahr.

A. Nephroses—No elevation of blood pressure and no kidney change, but often edema and large amounts of albumin.

B. Inflammatory Nephritis—High blood pressure and marked kidney change. (Parenchymatous nephritides, acute and chronic.)

C. Arterio-Sclerotic—High blood pressure and arteria and cardiac changes. (Cardio-renal-vascular disease.)

METHOD FOR ESTIMATING UREA OF BLOOD

Place a knife point of urease and 2 c.c. distilled water in graduated test tube. Add 2 c.c. blood.

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NEPHRITIS, Treatment of

Place in water bath at 50° C. for fifteen minutes. Add 10 c.c. distilled water. Add 1 c.c. freshly prepared metaphosphoric acid solution (20 per cent.).

Make volume up to 20 c.c. with distilled water. Let stand at least forty-five minutes or over night.

Filter. Add 0.2 gms. Merck's blood charcoal (Kaelin). Shake well. Filter.

Pipette 5 c.c. of filtrate into a colorimeter tube. Pipette 5 c.c. of standard ammonium sulphate solution (5 c.c.=1 mg. N.) into second colorimeter tube.

Mix 2 c.c. modified Nessler's solution and 8 c.c. distilled water in a test tube and add 3 c.c. of this to each colorimeter tube.

Dilute unknown with distilled water to match the color of standard.

The number of c.c.'s in unknown tube tells us directly the mgs. urea N. in 100 c.c. blood.

Normal blood urea nitrogen=12-13 mgs. to 100. Normal creatinine=0.25 about in blood.

Method of Blood Chemistry

These methods are colorimetric and the chemical products in the blood upon which deductions are made are blood uric acid, blood urea, blood creatinin and blood sugar, together with the halogen salts, more especially the chlorides. The phthalein test has to do with the general ability of the kidney to eliminate this substance in a certain number of hours from the blood, usually two hours after injection. The urine is taken and through a chemical test all of the phthalein is recovered from the urine, estimated by a percentage, and on this percentage are based conclusions as to kidney function. This is a most excellent test, but doesn't go into enough detail to arrive at a diag-

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nosis and prognosis. There is some suspicion in my own mind, as well as many other observers, that this substance is toxic. I have seen many cases develop violent headaches and nausea, and in one case uremic coma, soon after its injection. The whole question amounts to whether or not the kidney can eliminate the end-products of digestion, and also as to whether it is permeable to salt, water, and nitrogen. On this basis kidney diseases are classified as follows: (1) nephroses, where the kidney will not eliminate salt and water, and into (2) true nephritides, where the kidney can handle the water and salt but fails to eliminate nitrogen. On these classifications is based the treatment which is principally dietary and hygienic. Both cases should be on an extremely low protein diet, almost exclusively carbohydrate and fat, and in the nephrosis cases this diet should be salt free. We would not convey the idea that any diseased kidney can eliminate normally salt or nitrogen, but can handle one or the other comfortably.

The chemical methods for estimation of these products in the blood are as follows:

The blood is drawn as taken in the ordinary way from the vein in as large a quantity as wanted. The blood is laked, the picric acid is added to precipitate the proteids except in the urea test, where metaphosphoric acid is used, and urease is used to split up the urea into ammonium carbonate.

Ambard, by estimating the amount of urea N. in the urine and in the blood, and comparing them, compiles his coefficient or constant of renal function which is very interesting and instructive.

It is not within the scope of this paper to discuss the technique of these tests but the results. I have only submitted these tests to give an idea as to how the work is accomplished. The tests are tedious and burdensome until one has accustomed himself to them when they

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are as easy as an ordinary urinalysis. The apparatus and reagents can be obtained from any good drug house in the large cities of the East. The salt estimation in the blood is not carried out. We pay no attention to the salt content of the blood unless we have edema. which is an index that the patient is retaining more salt than the normal (seven-tenths of 1 per cent.), which increases the fluid elements to neutralize the same and gives us edema.

Fisher takes issue here and says edema is never caused by an excess of chlorides in the blood, but by tissue colloids and certain acidions that develop in certain conditions of disturbed metabolism as kidney disease, and are best treated by the administration of not only alkalies but chlorides as well. His theories are beautiful, his followers few.

The body will always keep the salt diluted to seven-tenths of 1 per cent. When no salt is being eliminated, even with the intake of salt which is found in ordinarily seasoned foods, we will soon have a great accumulation of salt and consequently great edema. So, in making a diagnosis of and treating nephritis, we should never stop with an ordinary examination of the urine, but should make a blood chemistry, and in the treatment this should be done twice weekly.

If you have a patient whose blood pressure is increasing, and especially whose diastolic pressure is increasing, who is unable to concentrate the urine above 1018 night or day, and who passes more than 400 c.c. urine from 6 p. m. to 6 a. m., regardless of what the urine may show, the uric acid, urea and creatinin estimate should be made.

Or should you have a case of diabetes which suddenly, without apparent cause, gives a sugar-free urine, a blood sugar estimate should be made. In many cases of diabetes, nephritis develops which renders the kidney impermeable to sugar. I have had this happen to me when I thought my treatment and my patient were accomplishing

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great good, when really the end was near. In the last stage cases a creatinin estimation is most important, as it shows a definite prognosis. Uric acid retention when the urea and creatinin are normal shows a beginning nephritis, as uric acid is the hardest of all to be eliminated, and, therefore, the first to be retained. Creatinin being the freest of all to be eliminated, the approaching end is shown by its retention.

DIET

The treatment should always be guided and regulated by the blood chemistry for the above substances. We should not lose sight of the urine tests and blood pressure, the eye-grounds should be looked into in all cases and focal infection should be carefully investigated. The most important factor in treatment of any kidney disease is DIET, which should be as low protein content as possible. In the nephrosis cases where there is a tendency to edema, salt should be rigidly excluded. Don't put anything into the organism which cannot be eliminated and whose presence in the blood is a dangerous menace to the patient's future happiness.

The fluid intake should be kept below 1,000 c.c. for twenty-four hours in cases suffering with edema and put to bed, especially where the myocardium is weak, and put on Karrell milk diet=2 oz. every two hours, and nothing else. In cases of true nephritis *nothing but sugar* should be given for several days until we feel sure that the patient "is protein free," then rigidly on the standard nephritic diet and don't allow above 80 gms. proteids daily.

To make the patient take the sugar make the water very sour with lemon, in this way you can get him to take large quantities of sugar which we say we are using to sweeten the lemonade. With this may be given cornstarch blanc mange, which is made up with sugar, starch and water and lemon juice. The two give us 400 gms.

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sugar, 112 gms. cornstarch, and 2 liters of water. Divide properly into feedings, which gives your patient 2000 calories daily.

STANDARD PARENCHYMATOUS NEPHRITIS DIET

7:00 A. M. (All food to be Salt free)
- Cocoa ..... 180 c. c. (6 oz.)
- Bread or toast.. 30g.
- Butter ..... 15g.
- Cereal ..... 100g.

10:00 A. M.
- Cocoa ..... 180 c. c. (6 oz.)
- Matzoths 1
- Butter ..... 10g.

12:00 M.
- Cream of Vegetable soup ... 140 c. c. (8 oz.)
- Baked Potato or Boiled Rice ... 130g. (Approximate)
- Bread or toast .. 30g.
- Butter ..... 20g.

3.00 P. M.
- Cocoa ..... 180 c. c.
- Matzoths 1
- Butter ..... 10g.

5:00 P. M.
- Milk ..... 180 c. c.
- Cream of Wheat with Rice .... 100 c. c.
- Sugar ..... 10g.
- Cream ..... 30 c. c.
- Bread or toast.. 30g.
- Butter ..... 20g.
- Stewed prunes or apricots ..... 100g.

It is important that the portions be weighed, as too much diet throws much work on the kidney and too little food will usher in dissolution from caloric need.

In long drawn out chronic cases a small but guarded amount of proteins should be added, as too strict carbohydrate and fat diet will ultimately fail to keep up the caloric need.

The proper amount of proteid, consisting of fresh meats and eggs, should be given. The protein intake should be in the neighborhood of 80 to 100 gms. daily, and here frequent blood urea tests should be made, in order to keep a careful watch on the N. level in the blood.

The cocoa used is to be prepared as follows:

Cocoa ..... 2 tsp. Hot water ..... ¼c.
Sugar ..... 1 tsp. Milk ..... ½c.

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Level measure of cocoa, sugar, water, and milk. Mix cocoa, sugar, and hot water. Cook over flame three minutes. Add milk and heat in double boiler to boiling point. Two drops of vanilla may be added as flavor. Beat with Dover beater before serving.

Uremic Diet.

Material	Weight	Measure	% of Protein	Fat	Carbohydrates	Calories
Lemonade						
Lemon Juice		Juice of 6 lemons				
Sugar	224 gms.				9.8	60
Water		1 litre			100	918
Cornstarch Blanc Mange						
Cornstarch	112 gms.				90	413
Sugar	164 gms.				100	631
Water		1 litre				
Lemon Juice		30 c. c.				

Divide into five equal portions feeding at 8 a. m., 10 a. m., 12 m., 3 p. m., and 6 p. m.

Method of making Cornstarch Blanc Mange:

Mix cornstarch, sugar and 230 c. c. of cold water to a smooth paste. Pour 750 c. c. of boiling water over it gradually, stirring constantly. Cook over flame until it thickens, meanwhile stirring constantly. Then place over hot water 30 minutes. Add lemon juice before serving.

One litre of whole milk daily can be added to the Standard Nephritic Diet, which gives 80 gms. proteid which can be handled in many cases.

This diet covers all that the patient needs, and I have seen them gain weight on it. This doesn't eliminate all possibilities of nitrogen retention by any means, as in true nephritis we have a nitrogen retention, non-protein N. which carries the patient off in the terminal stage of the disease. This nitrogen is the product of the individual's own catabolism, and the waste of his own body tissues. This cannot be overcome by any method of treatment or diet. We can only keep out extraneous insults in the way of proper diet and give the patient every chance to keep his house in order.

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NEPHRITIS, Treatment of

When uremic symptoms develop, evidenced by rapidly rising blood pressure, bad headache, dizziness, nausea, and in some cases coma, *all diet* should be withdrawn for 24 hours and give nothing but bicarbonate of soda, 5%, either intravenously or per rectum, with good skin and bowel elimination, then after 24 hours put on the uremic diet for two days or a week.

You see from the diets given that the crux of the whole matter is keeping on a high caloric diet with as little nitrogenous content as possible. The long continued and universally heralded sweet milk diet was a step in the right direction in that it was hoped to cut down the protein in the patient's diet, but sweet milk contains a *high percentage of nitrogen,* is low in calories, making it often an undesirable feeding. It also contains much phosphates, sulphates and water, putting too much work on the kidneys. In these cases the whole effect is to spare the kidney possible insult and give the patient a food that contains a high amount of calories. The end products of carbohydrate metabolism are water and CO_2. The CO_2 is eliminated by the lungs and much of the water by the lungs and bowel and not by the kidneys.

Rest Important

All cases of severe nephritis should be kept in bed, whether acute or chronic. Acute cases and acute exacerbations should be kept in bed as long as there is any sign of blood or blood casts in the urine. High blood pressure cases are not necessarily ones which will terminate fatally and earlier than the others, provided there is enough kidney function. The secret of the high blood pressure case is the adaptation of the patient's mode of living to his condition and his function. We do not consider all organic heart troubles as exceedingly dangerous, but we do tell the patient of his limitations and the amount of his heart function, and the same applies here.

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NEPHRITIS, Treatment of

Dyspnea means cardiac complications and myocardial insufficiency and the patient should be put to bed and given strophanthus or digitalis-diet cut down and bowels stimulated. If they have insomnia, give cold sponge bath at bedtime and veronal; and in the extremely nervous and dyspneic cases give morphine. Don't crowd the patient with water if edema is increasing and kidney not acting. Stimulate skin and bowel and use dry cupping to back. Use rest in bed and sweating. Give digitalis and leave off diuretics. Digitalis does not raise blood pressure and I have seen it give marked good effects in anuria, headaches and marked hypertension.

Marked hypertension is best handled by rest, elimination and diet. Remember, hypertension is as incurable as organic heart disease, is often compensatory and your drugging is of no avail and often dangerous to the life of your patient.

Drugs have little place in the therapy of kidney disease and should be given to meet symptomatic indication only. Iron in the form of Blaud's Mass or Bashams' Mixture should be the only drugs thought of as routine. The nitrates are as much a delusion as to permanent benefit as any agent that was ever advocated and often dangerous, as they may lower the blood pressure so as to cause serious effusions into lungs and pericardium; and by destroying compensatory hypertension may cause an overworked myocardium to lower its effort and a nearly destroyed kidney to cease its function entirely. The effect is entirely evanescent. The blood pressure will be reduced by the nitrates 20 m. m. in 20 minutes, but the effect is gone in from one to two hours. They should be used only to meet emergencies, and be sure you know the emergency. Many drugs, most of them proprietary, are on the market claiming to do wonderful things in reducing blood pressure. Blood pressure will not be reduced if due to arterial change, which it most often is, such as arte-

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riosclerosis and bad circulation in the kidney, and in many cases amounts to a complete obstruction. The iodides do not soften hard blood vessels and the theory that they caused absorption of tissue has never been proven. The only way the iodides have ever done high blood pressure good was in unrecognized cases of syphilis where the iodine was a specific. Radium was thought to be a specific for high blood pressure, but like many fads, was given up. The good effects gotten at bathing resorts are probably due to the radio active waters. An attempt was made to lessen the calcium in the diet with the hope of reducing blood pressure; this was also given up. Proper elimination, hygiene and proper food give us the only hope of handling our blood pressure cases in nephritis. In many cases of kidney disease we probably have a stimulation of the suprarenal capsules, giving off too much adrenine, which raises blood pressure.

Keep the alimentary tract in good condition, skin function working at its best and diet properly and you will get the maximum amount of benefit in kidney disease as well as in arteriosclerosis.

PROGNOSIS AND CONCLUSIONS

According to Chace, of New York, an increase in the uric acid of the blood is an indication of incipient nephritis, because it is the hardest to eliminate and consequently the first retained. The urea of the blood is a great aid as a guide to treatment as it shows any change in the patient's condition immediately. The normal urea content in the blood is 12 to 15 mgs. per 100 c. c., 1 to 2½ mgs. creatinine and 2 to 3 mgs. uric acid to 100 c. c. Increasing creatinine retention is of great prognostic service in the terminal stage, as the increase of creatinine, which is the easiest of all purin bodies to be eliminated from the kidney, shows a rapidly approaching end. Whenever the creatinin is above 5 mgs. per 100 c. c. the kidney seems unable to ever re-establish enough function to sustain life.

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Surg.

COMPRESSION NEURITIS DUE TO THE NORMAL FIRST DORSAL RIB

Sir W. I. de Wheeler, Dublin Journal of Medical Science.

Two cases of compression neuritis, under the care of Sir Harold Stiles, one of which I saw in Edinburgh six years ago, stimulated my interest in a condition which, until recently, has escaped general observation. At first sight the cases appeared to be some form of ulmar nerve neuritis, occurring in adults without trauma, or other obvious reason. On consideration it would have occurred to a surgeon that these patients were probably suffering from the presence of a cervical rib, but X-ray examination gave a negative result.

During the last few years I saw two cases in which I thought the condition might be relieved by operation, but my opinion was at variance with the opinion of those who had been previously consulted, and I was left with a polite indication from the patients that the activities of surgeons should be placed under some form of legal restraint.

About twelve months ago an athletic clergyman, 35 years of age, presented himself with the following history. He had met with no injury, other than the commonplace falls at football, etc. He had had no illness worthy of note, except influenza. But he had noticed for the past four years a gradually increasing loss of grasping power in his right hand. The loss of power began with painful cramps, which he attributed to too much writing. Improvement sometimes followed treatment, then a relapse would occur, and he was worse than before. On waking in the morning the arm would "fall asleep," writing became impossible, and he noticed a gradual wasting of the muscles of the hand. He thought that the first finger and thumb were the worst at first, but subsequently the last three fingers were the most affected. Various doctors were consulted, and he was treated, inter

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Skiagram showing the first dorsal rib after resection of the Segment causing pressure on the lower brachial trunk. (Two rows indicate the gap left after resection.)

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COMPRESSION NEURITIS

alia, for writer's cramp, neuritis, and syringomyelia. He always carried a specially warm glove to protect the affected hand from cold.

On examination it was found that the interossei muscles were practically non-existent, and that there was weakness in the median distribution as shown by the poor attempts to flex the first finger. An inability to fully extend the wrist and fingers at the same time pointed to involvement of the musculo-spiral nerve. Generally speaking, the appearance of the hand suggested a mild variety of main *en griffe*. Loss of power was most marked in the area supplied by the ulnar nerve. Sensation appeared normal, except in the ring and little finger, and here it was only slightly altered. He could not tell degrees of hot and cold with the same facility as when the test was applied to the normal hand, and he could appreciate light touches better than pinpricks. Pain, but for the initial cramps some years previously, had been conspicuous by its absence, and in this respect his case differed from others recorded. X-ray photographs demonstrated the absence of cervical rib, and showed a normal thoracic inlet.

During the examination the patient made a statement of great interest, with direct bearing on his condition. He said that the gripping power of his fingers depended greatly on the position of the arm. Above his head his power was greatly increased, and he could write on a blackboard steadily, and with ease. Grasping a tea-cup, on the other hand, was almost impossible. On giving him a pen and paper he wrote his name like a man suffering from paralysis agitans; but when the paper was put on the wall above his head the writing was clear and steady.

Treatment by massage, ionization, hot air baths, etc., was tried for several months. Special attention was given to the upper fibres of the trapezius, in the hope of increasing the support of the pectoral girdle upwards. There was no lasting improvement in his condition,

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COMPRESSION NEURITIS

and a paper published in the *British Journal of Surgery,* by Stopford and Telford, in October, 1919, describing ten consecutive cases of the condition, removed any remaining doubts of the best line of treatment to adopt.

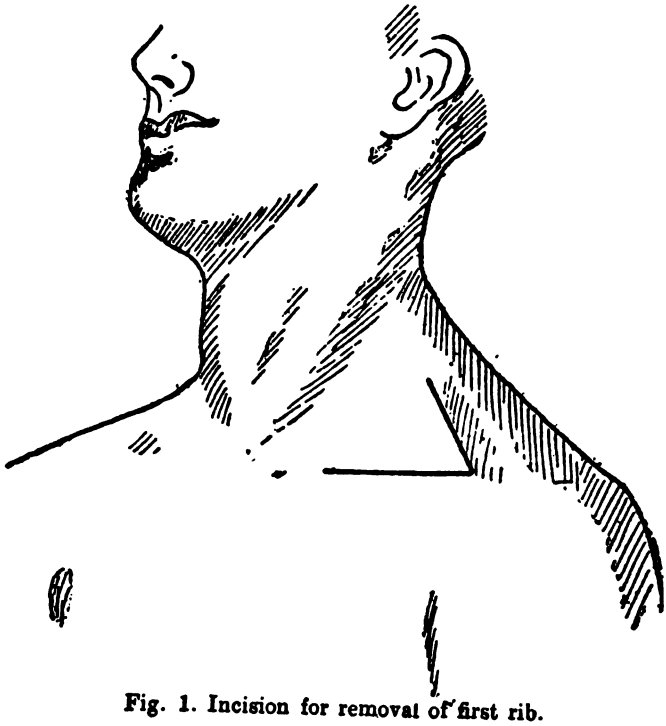

Fig. 1. Incision for removal of first rib.

The operation of removal of the first rib is out of the beaten track of most surgeons, and a lively recollection of the anatomy called for pause. The experience gained from this case and subsequent operations on the cadaver led me to think that the operation is not difficult, and may be accomplished with practically no risk.

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COMPRESSION NEURITIS

On January 1st an incision was made above the clavicle, as if for ligature of the subclavian artery; a second limb was added, running parallel to the fibres of the trapezius muscle. (Fig 1.) A little dissection brought the external jugular vein, the posterior belly

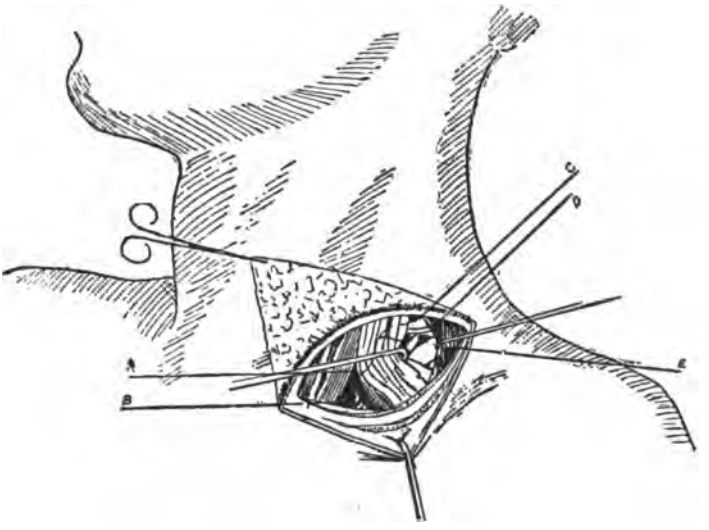

Fig. 2. Exposure of rib behind the brachial plexus.
A. Scalenus anticus. *B*. Subclavian artery. *C*. Plexus retracted.
D. Levator anguli scapulæ. *E*. Trapezius.

of the omo-hyoid, and the nerves of the brachial plexus, crossed by the transversalis coli vein into view. A finger in the wound located the back part of the first rib much higher in the neck than was mentally assumed. The brachial nerves were drawn forwards and downwards, and the interval between the scalenus medius and levator anguli scapulae muscles defined. The roots of the nerve of Bell in this position were not seen, but their hidden presence was respected. The attachment of the scalenus medius muscle to the first rib was divided subperiosteally, and the inner border of the bone cleared of periosteum and Sibson's fascia. (Fig. 2.) Doven's rib elevator with

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cleft palate raspatories were used to bare the underside of the rib, and to separate it from the underlying pleura. The rib was then divided with shears behind the scalenus medius. I felt I could not get far enough forward by dissection from behind, and when the rib was defined I retracted the nerves and other structures back and cleared the bone between the artery and the lower brachial trunk. The rib was now cut in front of the groove, which is supposed to carry the subclavian artery. (Figs. 3 and 4.) It was noted that the artery did not lie in direct contact with the rib, but the nerve was tightly stretched like a band across the inner border. At the completion of the operation, when cutting away an irregular point of bone, either

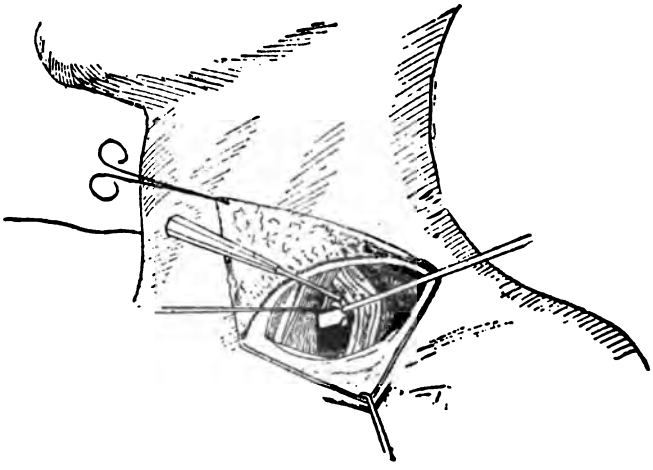

Fig. 3. Exposure of rib in front of plexus. Plexus and sternomastoid retracted. Doyen's elevator round the rib.

the external jugular or subclavian vein was injured. The bleeding was controlled in a moment and we had the satisfaction of feeling that the bone had been divided well in front of the compression point. The segment of rib removed extended from the posterior edge of the

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insertion of the scalenus medius to the scalene tubercle, so as to include the groove for the subclavian artery, and the trunk formed by the eighth cervical and the first dorsal nerves. Subperiosteal resection of the first rib may possibly be followed by regeneration of bone, but there are two reasons why a recurrence of compression of the nerve is unlikely: 1st. After removal, the divided ends of the rib fall towards the thorax, and new bone would take a curved direction

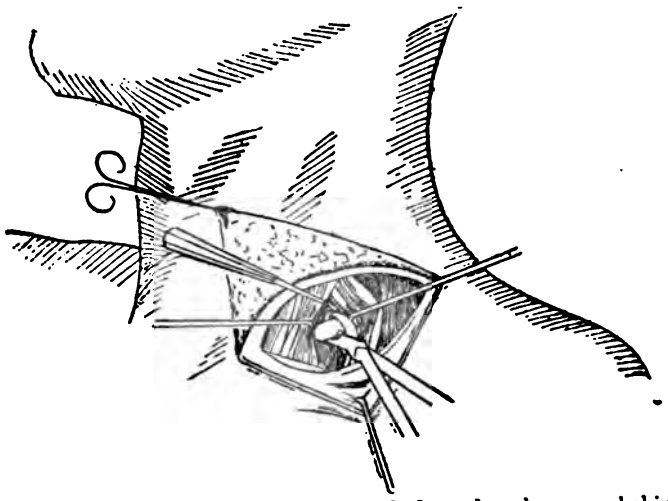

Fig. 4. Artery retracted in front and first dorsal nerve behind. Division of rib at scalene tubercle.

away from the plexus. 2nd. The periosteum is of necessity stripped from this rib as a sleeve is rolled up, and not by two flaps in the manner usually adopted lower down.

Some months must elapse before the result of this procedure can be judged. Following operation, as might be expected, there was more pronounced sensory and motor disturbance over a wide

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area, due to the retraction and handling of the plexus. In Thorburn's cases of cervical rib, pain was relieved by operation in 80 per cent.; paralysis was cured in 50 per cent.; impairment of sensation was improved in all, but cured in none; wasting usually persisted.

In addition to the cases operated upon by Stiles (unpublished), Thorburn, Murphy, Morley, Stopford, and Telford have drawn attention to brachial compression neuritis produced by a normal first rib.

The symptoms in a general way are those of cervical rib. Pain along the ulnar border of the arm and forearm was present in all the cases described by Stopford. The pain was always increased by anything producing depression of the shoulder girdle. He states that atrophy and paresis affect for the most part the intrinsic muscles of the hand, but the flexors and extensors of the wrist not infrequently are involved. Loss of protopathic sensibility is greater than the epicritic loss; a dissociation which notes nerve compression.

Etiology. Any condition which lowers the shoulder girdle, such as fractured clavicle, will pre-dispose to compression by bringing the lower trunk in more close relationship with the first rib. The majority of cases, however, occur in young adults without apparent cause. There is some evidence to show that when an unusually large contribution from the first or second dorsal nerves goes to the formation of the lower trunk of the brachial plexus, any condition which lowers the shoulder girdle may cause compression against the first rib. At puberty a descent of the shoulder normally takes place, especially in women. If there is muscular weakness, and this normal descent is exaggerated, and, at the same time the lower brachial nerve trunk contains a larger contribution than usual, compression is likely to occur.

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THE MEDICAL INTERPRETER

COMPRESSION NEURITIS

Diagnosis. The history of the case; pain along the internal cutaneous nerves; atrophy of the intrinsic muscles of the hand; the perception of touches with cotton wool, with the absence of distinct feeling of pinpricks to the inner fingers; and very constantly a loss of accurate differentiation between degrees of hot and cold are guides in excluding rheumatism, or simple neuritis. Inflammatory conditions of the nerve roots (radiculitis) are often associated with inequality of the pupils, due to sympathetic involvement in a position above the point where compression of the lower trunk takes place at the first rib. Syringomyelia must be excluded; and it is interesting to note that Murphy has drawn attention to an association between this disease and the presence of cervical rib. J. B. Murphy states that occasionally elongation of the transverse process of the seventh cervical vertebra, or acute angulation of the first rib at its juncture with the transverse process, produces the same symptoms as a true seventh cervical rib. Great care must be taken to ascertain before removal of a cervical rib that it is the real cause of the trouble. At least one case is described where a cervical rib was present, but the compression of the nerve was due to a normal first rib, and the symptoms disappeared after removal of the latter.

I have to thank Mr. A. K. Henry for his assistance in connection with the literature on the subject, and for valuable suggestions made when on the cadaver. Dr. McAuley kindly assisted me at the operation, and Sir Harold Stiles wrote me a full description of the operation as performed by him. Dr. Hayes, who knows the patient personally, after much trouble obtained the photograph shown—the region is full of vitfalls and difficulties from a radiologist's point of view.

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NEUROLOGICAL

Diagnosis of Nervous Diseases by Exclusion. Elmer E. Southard, M. D., and Harry C. Soloman, M. D., under the caption, Morbi Neurales, in the *Archives of Neurology and Psychiatry*, say that diagnosis by exclusion in neurology is a better and safer method than the plan of diagnosis advocated by DaCosta and others of looking for a salient feature in each case as a starting point. They suggest a "key method" or orderly approach as follows:

First, the case is thought of as of possibly infectious origin. The trouble is due to bacteria, parasites, etc. Under this head comes such nervous diseases as tabes, paresis, neuritis, myelitis, and so on. Second, should no infectious cause be found the case is considered as possibly due to some focal destruction of nerve tissue. Under this head come injuries, cerebral hemorrhage, increased intracranial pressure, etc. Third, should the focal destruction view turn out negative, the case is thought of as possibly due to sclerosis of the nervous system. This includes multiple sclerosis, hereditary sclerosis, and the like. Fourth, if still no cause for the complaint is found, then "imbalance"—metabolic, endocrin, sympathetic or narcotic—is the field of investigation. Fifth and last, should no diagnosis have been reached, miscellaneous nervous conditions are considered such as migraine, neuralgia, vertigo, tics, hydrocephalus, and so on.

Summarizing their contentions, the authors conclude as follows:

The method of diagnosis by orderly exclusion, already proposed for use in the diagnosis of mental diseases, is probably of equal value in the field of nervous diseases. The writers have endeavored to gather the main types of nervous diseases into a comparatively small number of groups for successive consideration by the tyro, or even by the expert, in diagnostic elimination. Experts may prefer a different order from the one proposed, but it is unlikely that any neurologist fails to use, consciously or unconsciously, some form of orderly diagnosis.

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NEUROLOGICAL

Yet the student is quite likely to be taught that the best procedure is to pick out some striking symptom in a case under consideration, and to follow that symptom back to textbook models for a suggestion as to the entity involved. He then endeavors to match the data of the case in hand with the possibilities laid down in the textbook.

We think that it is much more desirable to take the general situation in the body at large into account, and to include, if possible, first, the hypothesis of an infectious origin for the symptoms. Secondly, we try to exclude, if possible, the effects of coarse and otherwise destructive lesions of the nervous system, namely, in general, such conditions as show no signs of infection, but exhibit reflex disorders and signs of heightened intracranial pressure and the like, suggestive of focal lesion. Thirdly, we come to the hypothesis of the existence of one or other of those classic degenerations with which the neurologist is familiar. If classic degenerations can be excluded, we then proceed, fourthly, to the hypothesis of some kind of imbalance, perhaps metabolic or endocrin or sympathetic. If the diagnosis cannot be made on these lines, possibly the condition belongs in some miscellaneous and otherwise undefined or highly specialized group.

Even when the disease seems to be limited to a peripheral nerve, we consider that then the successive hypotheses can be preferably considered in that order. We think that by the pursuit of some such method as this the neurologist can bring his work better into line with that of general medicine. The method is, moreover, a very pragmatic one, since lines of treatment are specially indicated for the different great groups of disorders. But in so difficult a field we do not wish to dogmatize, and shall be content if our communication arouses interest in the application of the key or order principle to the diagnosis of nervous diseases.

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NEUROLOGY

Early Diagnosis of General Paralysis of the Insane. Egbert W. Fell, M. D., in the *Southern Medical Journal,* writes that early diagnosis of paresis is important more for the protection of the patient and his family than from the standpoint of therapy. This dementing disease destroys judgment and ethical sense as its first results. Consequently gross financial errors, immoral conduct and the like often result unless the patient is safeguarded by an early diagnosis. An early diagnosis can be made from (1) mental symptoms, (2) neurological signs, and (3) serology. The mental symptoms include marked change in character and disposition coming on in middle life, and undue self-confidence and tendency to reckless investments and behavior. "A neurasthenia coming on first in mid-life in a male without apparent adequate cause should lead to a thorough examination" for possible paresis. Failure to take business worries seriously is rather characteristic also.

The neurological signs are described by the author as follows:

"A convulsive attack is occasionally the initial symptom, and such an episode always calls for a physical and serological examination. Transitory paralyses, or aphasias, without loss of consciousness, are characteristic of paresis.

"When paresis is suspected, anomalies in the pupils, and in their reaction to light are among the more important signs to be looked for. The Argyll-Robertson pupil is by no means a constant finding, occurring in less than one-half of the cases, but there are almost always some pupillary changes. The Argyll-Robertson pupil, when it does occur in an insane person, usually means paresis. A failure of light response in one or both eyes, whether or not associated with failure of accommodation response, is very important, as is also the failure of one pupil to contract when light is thrown in the other eye.

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NEUROLOGY

Simple inequality is not of great importance from a diagnostic standpoint. Irregularity of outline usually points to a luetic infection. Inequality of reaction is easily made out, but the decision that the pupils are sluggish, when they react equally, should be made with due consideration for the normal variations.

"A speech defect in its early stage is best made out in ordinary conversation, rather than by the use of test phrases. Voluntary control is not entirely lost, and the concentration of the patient's attention on what he is doing is often sufficient to overcome it. The paretic speech defect usually consists of a skipping, slurring, or repetition of syllables.

"Unequal innervation in the field of the seventh or the third nerve, shown by a difference in mobility of the two sides of the face, a wiping out of the naso-labial fold, a ptosis, or a lack of balance of the extrinsic eye muscles, is easily made out, as is also the tremor of the lips on showing the teeth, or of the protruded tongue.

"To say that the knee-jerks are increased or diminished, if they are equal and the alteration is not marked, is often a difficult problem, but a difference of reaction on the two sides is easily determined. It is important in taking the knee-jerks that the patient is sitting or lying straight, and that the two legs are in similar positions. In this, as in other tests of the sort, the same procedure should always be used in order that a standard for comparison will be developed in the examiner's mind. Increase of the knee-jerks occurs in many other conditions, but has not the diagnostic significance that the absence of them has."

The chief serological findings are increased cells in the spinal fluid, increased globulin, positive complement fixation and positive Wasserman of the spinal fluid. A positive blood Wasserman in a mental case is highly suggestive also.

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NEUROLOGY

Summarizing the author says (1) the early diagnosis of paresis is especially important from the standpoint of protecting the patient and his family from the results of failing judgment.

(2) A change in disposition or habits in a middle aged male should always cause suspicion of paresis.

(3) A diagnosis of paresis is possible even in the early stage by a careful consideration of the mental, neurological and serological findings.

(4) A diagnosis on mental symptoms alone is uncertain.

(5) A diagnosis on physical and mental symptoms has a definite margin of error.

(6) The positive spinal fluid Wasserman in a mental case is the most reliable sign of paresis.

Med.

OPHTHALMIA NEONATORUM

Prophylaxis and Treatment of Ophthalmia Neonatorum: Trials of Anti-Gonococic Vaccinotherapy. Ginestous, hebd. des sciences medicales de Bordeaux.

Three cases of ophthalmia of the newborn were treated by the vaccinotherapy of Nicolle and Blaizot.

In one case there was double ophthalmia; seen the fifth day, the right eye already presented corneal ulceration.

Local treatment was employed together with the anti-gonococic vaccinotherapy; two injections were given at twenty-four-hour intervals, the purulence disappeared and a cure resulted.

In another case, the vaccinotherapy (always used concurrently with local treatment), with two injections at twenty-four-hour intervals, the purulence disappeared and a cure was obtained. The injections were made in the buttocks (intramuscular).

On the contrary, in another case seen on the tenth day, five days

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OPHTHALMIA NEONATORUM

after the appearance of the ophthalmia, the result was negative. Six injections repeated daily did not succeed in suppressing the suppuration, which did not subside until the fifteenth day of local treatment.

The author maintains that in view of these results the little patients should not be deprived of the vaccinotherapy together with proper local attention.

Med.

PELLAGRA

George M. Niles, in Practice of Medicine in the Tropics. Oxford Press, London.

In abstracting this rather extensive article, neither the history nor etiology will be embraced. The history can be obtained from contemporaneous textbooks; the etiology is, unfortunately, yet *sub judice*. The therapy, however, is a live subject, and this abstract endeavors to cover it adequately. Incidentally, it might be mentioned that the treatment herein advanced is based on an experience of over twenty-four hundred cases.

The general treatment of pellagra naturally divides itself into (1) dietetic; (2) hygienic; (3) medicinal; (4) climatic.

Dietetic Treatment

Until the theory regarding the etiology of pellagra is clearly settled, and the present zeist views as to some products of spoiled corn being responsible are exploded, it would appear the part of wisdom to give our patients the benefit of the doubt by excluding from the dietary, so far as possible, all articles of food made from corn or corn products. We say "so far as possible," for there are so many adulterated food products on the market in which some derivative of corn is the adulterant that we cannot always be sure that corn is really absent from our daily food or drink. This would also apply

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forcibly to the dietaries of various institutions, especially those for nervous and mental invalids.

In the early manifestations of diarrhea, this symptom being in the main compensatory, a restricted diet has but little influence, though, of course, the ordinary care as to food with a large amount of irritating residue should be noted. This applies only to the early diarrhea before inflammatory changes of the intestinal mucosa have occurred.

Pellagra being both chronic and exhausting, active supportive measures are indicated from the very outset. Every patient with pellagra, no matter how light it appears, may be considered to have entered into a long, taxing battle, and his daily caloric requirements should be guarded most zealously. Along this line should be stressed the caution that when certain articles of food of which the pellagrin is fond are prohibited, the medical attendant should see to it that these articles are replaced specifically by something else with an equal caloric value. The writer has observed a number of patients where one article after another has been eliminated from the daily dietary until the patient was not receiving enough for an infant in arms. The diet should be easily assimilable, highly nutritious, and it might be added that pellagrins seem to bear specially well the flesh proteins.

Meats

It has been the experience of the writer that all along through the course of the disease meats are well borne, and even in those conditions where there is much active gastro-intestinal irritation, they agree better than in a like amount of irritation from other causes. Tender broiled steak or roast beef, lamb or other roast meats may be given twice daily, or, if the mouth is too sore to chew either, the scraped beef or that ground in a sausage mill may be served. This

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applies to the white meats, and, if the suggested grinding of the meats is carried out, it is as little irritating as possible to the inflamed buccal membrane.

Eggs are generally permissible, though if there is a flatulent tendency, it is well to give only the whites. The albumen of raw eggs may be prepared in various ways, limited only by the ingenuity of the nurse, being flavored with orange, lemon, grape, or other juices, and when prepared this way seldom disagrees. These egg albumens are most valuable in the exhausted typhoid conditions, and may be administered early and often.

Sweet milk is valuable when it agrees, but, unfortunately, many pellagrins show an idiosyncrasy against it. Flatulence frequently follows its ingestion, and in many patients the stomachs furnish enough rennin to promptly coagulate the milk, but are tardy in disintegrating the curds, so there is present a sense of weight and discomfort in the epigastrium. Peptonizing the milk usually obviates this, but few pellagrins relish peptonized milk.

Buttermilk is a most useful article of diet, seldom upsetting the stomach or intestines. The artificially soured milk, or lacteal champagne, containing all the fat, is often not only well borne, but acts as an appetizer.

Vegetables and Cereals

When constipation is in evidence, oatmeal, tender vegetables in purée form, thoroughly baked Irish—not sweet—potatoes, or cereals with but little sugar will aid the peristalsis of the intestines.

Later in the course of the disease, when inflammatory lesions have set up in the intestines, or a chronic gastritis complicates the situation, the diet should be suited to the condition, remembering, though, that to some extent the gastro-intestinal tract will bear more in pellagra than when similarly inflamed from other diseases.

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PELLAGRA

Barley-gruel, rice-water, the lighter cereals, thick doughs with scant condiments, malted milk and egg, dry meat powders, dry albuminized powders, with butter up to the patient's ability to eat—this is a general summary of the later diet.

Olive oil, in one-half or one-ounce doses at intervals, will often help the abdominal cramps, while the addition of an egg to each portion of the olive oil will greatly swell the daily calories.

Legumes

The writer has been much impressed with the favorable results following the use of beans and peas alone. The beans and peas should be fresh or dried, not canned. The palatable pea or bean soup may be served and eaten in any of the other well-known forms.

After all symptoms of pellagra have disappeared, corn and other starchy foods in moderation and guarded with an abundance of milk, meat or legumes, and, preferably, with all of these, may unhesitatingly be allowed.

Alcoholic Liquors

The experience of the writer has rendered him chary in the use of alcohol in pellagra. It would appear that the possible fuel and food value of alcohol is more than counterbalanced by its malign effect on the gastrointestinal mucosa, as has been noted in a number of instances where this agent was added to the dietary in apparently convalescing cases. In exceptional cases, when whisky or brandy are deemed necessary by the physician, they should be well diluted, and be given as milk-punch, egg-nog or with grape-juice or lemonade.

To adjust the daily regimen wisely to each individual case, respecting idiosyncrasies, likes and dislikes, is no easy task, and will require both time and patience. The problem of the bodily upkeep in pellagra is of basic importance, and should never be lost sight of

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from the beginning of the management. Its successful solution will in most instances decide the ultimate prognosis, marking the difference between recovery and death.

Hygienic Treatment

In no other chronic or exhaustive disease is there a greater necessity for hygienic habits than in pellagra. At best the patient has an uphill fight, and both body and mind need every aid that can be afforded.

One of the first hygienic considerations is rest. As far as practicable this should be enforced, while any evidences of bodily weakness, nervous irritation, or mental instability are evident. The patient should be put to bed for a while, and every disquieting factor removed. Good ventilation, not too much light, freedom from disturbing noises, cheerful companionship, and all that train of helpful influences that prevents confinement being so irksome are indicated. In those cases where it is not possible to obtain complete rest, active exertion should be avoided, and the judgment and tact of the attending physician invoked so as to meet the exigencies of the situation.

In the neurasthenic or mentally disturbed class of pellagrins complete rest is absolutely essential, and no marked or lasting benefit may be expected without it. In this division of treatment, with propriety may be mentioned the avoidance of light—sunlight in particular. The rays of the sun, especially in the springtime, seem to exert a peculiarly irritating effect on the erythema. The patient should be cautioned to keep out of bright sunlight as much as possible, and, when out of doors, to protect the hands and forearms with gloves, and the face and neck with a broad hat, veil, or umbrella.

It has been observed many times that an improving erythema, or even a comparatively normal skin surface, will quickly flare up on injudicious exposure to the rays of the sun.

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PELLAGRA

The patient should be enjoined to masticate the food thoroughly, so as to put no undue burden on the gastrointestinal mucosa. Parenthetically, in this connection, might be noted the advisability of putting the teeth in order. A regular examination of the oral cavity will reveal many foul conditions, where tender or defective teeth or pyorrhea alveolaris not only render effective chewing impossible, but a constant supply of pathogenic bacteria from this cavity augments the autointoxication already present.

The writer recommends that in all pellagrins with the slightest indication of buccal infection, a one-half grain injection of emetine be given every day for six days. After two weeks have elapsed this should be repeated; and, if the mouth remains sore or unclean in appearance, the "six-day treatment" with emetine may be repeated four or five times. The importance of obtaining a hygienic state of the mouth, the main portal of entry to the body, has been underestimated, and the medical attendant will find the time and trouble expended in putting this cavity in order well spent.

As in the dietetic regimen, each case must be managed on its merits, regulating the habits in accordance with the financial ability, temperamental status, or varying phases of the illness.

Medical Treatment

The application of medicinal remedies in pellagra is, in the opinion of the writer, fruitful of much benefit. Many of the most distressing symptoms can be either relieved or mitigated, and just because a positive specific has not been found is no reason why a therapeutic pessimism should be allowed to dampen the ardor of the physician. Therapeutic pessimism is the inevitable refuge of the weakling, and if the medical attendant is imbued with that spirit he should hesitate in treating pellagra.

For the sore mouth and tongue an application of nitrate of silver

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(20 grains to the ounce of water) daily or on alternate days is recommended. A mouth-wash of boroglycerin (25 per cent.) or half-strength liquor alkalinus antisepticus, or a combination of chlorate of potash and glycerin, with rose-water as a vehicle, will generally prove satisfactory. For the aphthous ulcers, ofttimes so painful, gentle "touching" with half-strength aromatic sulphuric acid once daily, or a liberal application of a mild solution of salicylic acid in glycerin and alcohol will be sufficient.

For the salivation give 1-200 grain atropine every four hours till the dribbling ceases; then stop, for the continuance of the atropine would cause uncomfortable dryness of the mouth and fauces.

Should the interior of the buccal cavity and fauces become dry and uncomfortable, a frequent spraying with benzoinated albolene will prove most grateful.

Constitutional Treatment

As a constitutional treatment the writer recommends the following, which has been evolved from his own experience, augmented by suggestions from others in whom he has confidence.

At present the writer employs for hypodermic use 16-minim ampoules of iron arsenite solution; and ampoules of sodium cacodylate 1 c. c., each ampoule containing three-fourths grain of the drug. One each is injected on alternate days, injecting them under careful aseptic precautions. This injection on each day, but alternating the drug, is kept up for two or three weeks; then the injection is given every second day, still alternating the ampoules for two or three weeks longer. After that the injections are given only about once a week (still alternating) as long as it is practicable or considered advisable.

Internally it is recommended that a combination of Fowler's solution and a saturated solution of potassium iodid be given, beginning in 5-drop doses and increasing one drop daily until the

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physiologic limit is reached. Generally the puffiness under the eyes appears when about 25 to 30 drops are being taken. When this appears, the drops should be discontinued for two days, and started at the minimal dose of 5 drops, increasing gradually, as before. Some can take larger doses without discomfort than others, but it answers no good purpose to push it after the physiologic limit has been reached. Occasionally the patient, on account of excessive irritability of the alimentary tract, will prove intolerant of arsenic internally. Should this be apparent, the saturated solution of the potassium iodid alone may be pushed, given in a little sweet milk.

This is the formula:

R Liquor potassii arsenitis, 3 drams.
Saturated solution potassii iodidi, 5 drams.

The number of patients who could not tolerate this formula have been extremely few.

After the active symptoms of pellagra have abated, and iron does not seem to be indicated, this formula may be kept up almost indefinitely in 6- or 8-drop doses three times daily.

Treatment of Special Symptoms

For the frequent diarrhea, bismuth-betanaphtol and resorcin, given with milk of bismuth as a vehicle, has generally been sufficient. This failing, there may be given tannigen, protan, or heavy doses of bismuth subgallate. As a last resort, powdered opium or tincture of opium may be used; but opium, as an intestinal astringent in pellagra, has its disadvantages, as it seriously interferes with the much needed elimination. The writer prefers 10-grain doses of tannigen, given as indicated by the severity of diarrhea.

When there is a paucity or absence of free hydrochloric acid in the gastric secretion, 10 or 12 drops (not more) of dilute hydro-

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chloric acid, well diluted and given thirty minutes after meals, will often greatly aid digestion and lessen the "heavy feeling" so much complained of.

For the anorexia, tincture of nux vomica, condurango, calumba or quassia, with compound tincture of gentian or cinchona as a vehicle, will often sharpen an indifferent appetite if given a short time before mealtime.

In anemic or cachectic conditions the various ferruginous preparations are indicated, as well as cod-liver oil.

A malarial complication, often present, either openly or latently, will require the addition of quinine, which may be administered in the most eligible form.

Constipation, when present, may be controlled by castor oil or enema, drastic cathartics being inadmissible. In these frequent cases of constipation in pellagra an injection of 2 to 4 ounces of cotton-seed oil or olive oil, introduced into the rectum on retiring and kept in all night, will generally produce a soft, unirritating and effectual evacuation of the bowels the next morning. The writer is also employing, with good results, the liquid paraffin, given as required—generally a tablespoonful night and morning. Mention might also be made of phenolphthalein, which, in 1-or 2-grain doses at night, is followed by satisfactory movements.

The symptoms of nervous irritation, expressed by burning hands, feet, or mouth, will often tax to the uttermost the resources of the physician. These may be combated by compresses saturated with a mild solution of bichloride of mercury, ice cold, and applied at frequent intervals; by baths in hot mustard water or slightly mentholated applications of liquid albolene. In occasional instances this burning becomes so intolerable as to require an anodyne.

The aches and shooting pains may often be alleviated by 5-grain

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doses of acetylsalicylic acid, given four times daily. This sometimes burns the stomach, but not often. Phenacetin, to which is added a small amount of citrate of caffeine, may also be employed for the headache or the different neuralgias. Massage in some instances affords decided relief in muscular pains, and the rubbing in of a gently stimulating liniment is not amiss.

External Treatment

The erythema, being a secondary symptom, should receive only palliative treatment. Too many applications tend to irritate more than soothe, and too many ointments can sometimes transform a dry erythema into a moist one, which is far from being desirable.

While the hands are red and hot, this is serviceable:

℞ Pulv. calamine, 4 drams
Pulv. zinc oxide, 3 drams
Rose-water, 2 ounces
Lime-water, to make 1 pint.

This may be applied *ad libitum*.

After desquamation begins, there are several mild ointments available.

The writer has used with satisfaction the 5 per cent. boric acid ointment; also:

℞ Pulv. calamine, ½ dram
Zinc oxide, ½ dram
Olive oil, 1 dram
Lanolin, to make 1 ounce.

Gentle cleansing of the scales or crusts after having been softened with some oily substance will promote the comfort of the patient.

When other applications to sore and crusted skin have failed, the writer recommends the scarlet-red ointment. This may be applied once or twice daily and is quite efficacious. An objection to its use is the stain it produces upon any article it touches.

When the erythema attacks the eyelids and sympathetic con-

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junctivitis ensues, a weak solution of argyrol dropped in the eyes will generally afford adequate relief.

For great exhaustion, the intravenous injection of saline solution (800 c. c.) every day, or alternate day, is suggested.

Treatment of the Mental Factor

For the mental and psychic symptoms, appearing as they do in such multitudinous forms, only general suggestions can be made. To treat these manifestations by any rule-of-thumb method would be irrational and fruitless.

Sleeplessness may be combated by chloral, trional, or veronal. By the addition of phenacetin to veronal the good effect is augmented and disagreeable after-effects prevented.

Tincture of opium or powdered opium is useful for the melancholia, but the drug must be aided by isolation and rest.

When the mental symptoms deepen into the more pronounced forms of melancholia or lapse into dementia or amentia, the patient should be put in an institution for the mentally sick. These unfortunate invalids are subject to so many varying moods, suicidal and otherwise, that it is impracticable to care for them properly and safely at home.

While many of the pellagrous neuroses and psychoses are the result of degenerative changes, where scar-tissue impedes and cuts off conduction, still, in many instances, if the treatment is persisted in with a spirit of optimism, unexpected improvement may brighten a gloomy prognosis and light may emerge from sad obscurity.

We are not, as yet, thoroughly conversant with the influences of the mind over metabolic processes, upward or downward, and while due caution should always be observed in any predictions, no one man or set of men is privileged to abrogate the functions of a supreme court by asserting that pellagra is an incurable disease, and that medical treatment is valueless.

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PELLAGRA

Climatic Treatment

Pellagra being in the main a disease of hot weather, it has been found in nearly every instance that a sojourn in a cooler climate is beneficial. Cold climates, or those where the winters are long and summers correspondingly short, have never seemed to furnish congenial soil for the spread of pellagra.

Pellagrins, unless too far advanced, get better with cold weather, and only the practically hopeless cases go on to exhaustion and death in the winter season.

Many, from financial or other reasons, cannot seek a cool climate, but all that can should avail themselves of this aid. In this country, a cool climate in the summer time and a high altitude must be sought, and careful advice must be given regarding the influence of altitude on the vital organs.

It has been the experience of the writer and others that the benefit to the pellagrous symptoms nearly always exceeds the possible danger of high altitude, and, unless there are strong reasons, this consideration should not prevent climatic change.

In order to reap the full benefits from this change the writer believes that the pellagrin should avoid hot weather for ten or twelve months after all symptoms have disappeared.

Where it is not practicable to reach an actually cool climate, a lesser change is sometimes beneficial, but the change should always be to a higher latitude and altitude—never a lower one.

This, in both a general and specific manner, covers the treatment of pellagra. Much of it has, of necessity, been rather general; but the writer feels that the therapeutic field, according to the present knowledge of the disease, has been fairly covered.

Believing that we owe our disconsolate pellagrins a therapy embracing both courage and optimism, this study is offered, confident

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PELLAGRA

that from the employment of the suggestions satisfactory results will be attained.

Med.

PERITONEAL INFECTION

New Urinary Reaction in Acute Peritoneal Infection. Sgambati, Rome. Il Policlinico.

The author states that he has observed a chromogen reaction in the urine of those suffering from acute intoxication of peritoneal origin; which has not been heretofore described. The constancy of this reaction in the above mentioned condition, and its non-appearance in the infection of other organs, make it worthy of mention.

The test is made by pouring 8 or 10 c. c. of urine in a test tube which is held in an inclined position and allowing 2 or 3 c. c. of fuming nitric acid to run along the side of the tube so as to underlie the urine, using a pipette to introduce the acid. Care should be taken not to mix the acid with the urine. The tube is then held vertically and again inclined; this is done several times. This is for the purpose of augmenting the contact of the two liquids, without mixing them together. If the reaction is positive, above the ring will be seen the yellowish red displayed by all urine, another ring of dark grayish blue, more or less intense. On standing a short time the color is slightly augmented.

Diffusing the color through the urine by slight agitation and holding to the light it appears a brownish red. If chloroform is added and the supernatent fluid decanted a beautiful ruby red color is noted.

The reaction is valuable:

1st. It is specific of the acute peritoneal infection even when very circumscribed.

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PERITONEAL INFECTION

2nd. The existence of the reaction is in direct relation to the gravity of the general intoxication, and therefore with the germs that have produced it; more than with the extent of anatomical damage. In general, it is more intense in grave cases, such as in those caused by perforation.

3rd. There is no connection between the presence of this reaction and any other chromogen substance in the urine (idol, skotol, bile pigments), nor with the functional condition of the intestine.

4th. The reaction is present very early in all cases of acute peritonitis, often antedating every other symptom.

The reaction diminishes rapidly as the general condition improves.

Med.

PHARYNGITIS

Salicylate of Soda in the Treatment of Angina. P. Meyer.

In the Brazil-Medico, Rio de Janeiro, Meyer recommends the use of a solution of sodium salicylate (6 grammes to 120 grammes of water, 90 gr. to ℥IV as a gargle. A tablespoonful of the solution in a half glass of water should be used eight times in 24 hours.

As the salicylate of soda in solution changes quickly, it should be dispensed in powders, each one containing a sufficient quantity for one day; these powders may be kept in a wide mouthed bottle to avoid absorption of moisture.

In sore throat the action of this gargle is remarkably efficacious, the sensation of constriction passes quickly, and after it has been used two or three times the pain is greatly relieved and deglutition becomes easy. It produces a real anesthetic effect on the pharyngeal mucosa and also in the mouth and on that of the gums.

According to Hirtz, the solution of salicylate of soda used locally as a mouth wash is the remedy of choice in aphthous stomatitis. A

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PHARYNGITIS

pledget of absorbent cotton moistened with the above solution will relieve the pain after the extraction of teeth, if pressed gently into the cavity.

One of the advantages of its use is the fact that it is an antiseptic, par excellence.

Med.

PITUITRIN IN LABOR

The Action, Use and Abuse of Pituitrin. A. G. Schultze, J. Lancet, XXXIX, 584

Pituitrin, when used with proper caution, may give good results, but it has dangerous potentialities. If, in a healthy multipara, the os is fully dilated, the membranes ruptured, the perineum non-resistant and the presenting part on the perineum, then conditions are ideal for the use of pituitrin, if the pains are sluggish. The author warns that an exhausted uterus needs relief and not stimulation, and states that the distinction must be made between this condition and a lazy uterus.

During labor, too large a dose of pituitrin may cause great damage to the soft parts or even rupture of the uterus. The fetus also may suffer from cerebral hemorrhage or asphyxia. Three to four minims is the accepted dose and never a full c. c. It should not be used in the first stage at all nor in the second stage if labor is progressing normally.

Pituitrin may be given to lessen hemorrhage after delivery and in Caesarean section. Also for intestinal distention and retention of urine. If abortion is inevitable the use of pituitrin may hasten its completion.

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Med.

PNEUMONIA

Central Pneumonia; Local Pain as an Initial Symptom of the Disease. (Polmonite centrale il dolore locale come sintoma iniziale del morbo.) Dr. F. Fazio. Med. pratica, Napoli, No. 4, 85-88.

In central pneumonia the morbid process takes place in the center of a lobe and the lung tissue surrounding it is permeable to the air current. The occurrence of this form of pneumonia has been denied by a few writers, but the great majority of authors assert its existence, and Dr. F. is of the latter opinion. The physical signs are absent in this form of pneumonia and the diagnosis must be made from the general symptoms, chills, fever, dyspnea, cough, and reddish expectoration.

But sometimes these general symptoms, especially cough and expectoration, are absent, and the diagnosis becomes difficult. Now Dr. F. observed in a number of cases a sign which appears in the initial stage of the disease. This sign consists in a stinging, lancinating pain on the side affected. He mentions the case of a lady of 40 years, who showed no sign of pneumonia up to the sixth day except a lancinating pain on the affected side. On the sixth day all the usual signs of pneumonia appeared confirming the previous diagnosis. Dr. F. does not claim priority for this sign as it had already been mentioned by Boulay in his excellent treatise on acute pneumonia.

Med.

PNEUMONIA

Serum and Vaccine Treatment for the Pneumonias. F. R. Stewart. Med. Record.

The old classification of pneumonia as lobar pneumonia and broncho-pneumonia is giving place to a new classification, namely: pneumococcus pneumonia, streptococcus pneumonia, and mixed pneumonias in which both the pneumococcus and streptococcus, and

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sometimes other micro-organisms take part. Attention should be directed to the excellent work done at the Rockefeller Institute in regard to types of pneumococci and their specific etiological relations to the pneumococcus pneumonias. The serum treatment of the pneumonias and the possibility of immunizing troops and civilians against pneumonias should be considered.

The work of medical scientists and the results of their findings in this connection will prove far-reaching in the practice of pneumonia prophylaxis and treatment. More attention will be given to the future treatment in hospitals where laboratory facilities are conveniently at hand. The tendency in the cities and towns will be for the general practitioner to transfer pneumonia patients immediately to the hospitals when it is possible to do so. As for the country doctor, situated remote from medical centers, the question, what shall he do? is a most interesting subject.

A general practitioner from the country district may well ask: "How is a physician engaged in country practice and not provided with proper laboratory facilities to determine whether his patient has a pneumococcus pneumonia or a streptococcus pneumonia, or is he suffering from a mixed infection?

"You advise the country physician to send a specimen of sputum to a medical center for bacteriological diagnosis. This advice I do not consider of much value. Pneumonia is a treacherous and uncertain disease. A patient may be taken mildly ill with every reasonable expectation of recovery, yet may die suddenly and unexpectedly. If the doctor is forced to wait two or three days for a bacteriological diagnosis, the chances of recovery from a serious disease, that in its usual course terminates in from five to nine days, are reduced to a minimum.

"You say that the fundamental principle of treatment, in the

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light of present knowledge, is to inject promptly anti-pneumococcic serum intravenously in all cases of pneumococcus pneumonia, whether mild or severe, and give doses sufficiently large early in the treatment of the case to destroy completely the infecting micro-organisms and neutralize their poisons. But how is the general practitioner, located in the country remote from medical centers, to know whether his patient has pneumococcus pneumonia or not?

"You also tell me that there are several types of pneumococcus; also, that there are several types of streptococcus; therefore, there are several types of pneumococcus and streptococcus pneumonias. Should a specific serum be used for each type of pneumonia? Or is the proper procedure to give the patient a polyvalent antistreptococcus serum conjointly?

"I confess that the condition of my mind seems to be one of confusion worse confounded."

The dilemma of the country practitioner is typical of that of many practitioners in the country practice all over the land. What can the American Therapeutic Society do to aid the country doctor in this dilemma? As an aid to the discussion of the subject a brief review of some points in regard to the etiology and treatment of the pneumonias, resulting from researches in this country and abroad, may prove serviceable.

We are indebted to Avery, Chickering, Cole and Dochez for their researches conducted at the Rockefeller Institute, which have demonstrated that at least three types of the pneumococcus cause pneumonia. Furthermore, pneumonia may be caused by several other kinds of micro-organisms, as we all know.

The pneumonias caused by Types I, II, and III, including Group IV, which possibly includes twelve or fifteen other types, vary in frequency, severity, and in response to serum treatment.

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THE MEDICAL INTERPRETER

PNEUMONIA

The following editorial statement occurs in the department of therapeutics, *Journal of the A. M. A.:*

"The serums against infection with Type I organisms appear to have produced especially good results, and to be highly effective in treatment of cases of pneumonia due to its type of organisms. The serum of Type II is much less efficacious and, indeed, it has not yet been thoroughly demonstrated whether it has any valuable effect on the outcome of disease. The serum for Type III organisms has apparently but slight therapeutic power and has not been considered worthy of use in infections with Type IV pneumococcus. Commercial preparations of these serums are available and also polyvalent serums. These polyvalent antipneumococcus serums are of extremely doubtful value. It has been suggested that polyvalent serum be given until the type of the organism is determined, and that following this the specific serum for Type I or Type II may be utilized if the infection proves to be of that character. . . . It has also been suggested that every pneumonia patient receive, immediately after being taken to a hospital, a large dose of antipneumococcic serum of Type I, with the idea that the case may prove to be of that character, and considerable time will be gained. . . . The serum treatment of pneumonia with Type I is quite likely to be harmful because the intravenous injection of 100 or more cubic centimeters of horse serum can hardly be devoid of harm, and is certainly not to be used except when very decided benefit may be expected to follow its use."

I am calling attention to the latter statement because the editorial writer was evidently not posted in regard to the chemical composition of anti-bacterial serums in general. Polyvalent serum and Type I serum are practically identical, the only exception being that the former contains antibodies against Type I pneumococcus as Type I serum.

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PNEUMONIA

Polyvalent serum, therefore, if properly prepared, has exactly the same specific action against Type I infection as Type I serum has, and it also possesses immunizing properties against the other types of the pneumococci, in so far as the antibodies against these types are effective in combating Types II and III. It is true that whenever any one of these serums is employed "100 or more cubic centimeters of horse serum" are injected. But the writer of whom the editorial speaks, advises routine injections of Type I serum before waiting for type diagnosis, and, therefore, advises the injection of "100 or more cubic centimeters of horse serum" containing antibodies against Type I pneumococci, before waiting for type diagnosis. The advice in regard to the immediate use of serum treatment without waiting for type diagnosis, for the purpose of saving time, is good advice, and if the physician uses polyvalent serum containing antibodies against Types II and III pneumococci, he is not only following that advice, but he is possibly giving his patient even better service than though he had only injected Type I serum. In either case he is forced to inject "100 or more cubic centimeters of horse serum" for he cannot administer the required dose of antibodies without so doing, whether he uses Type I serum or the polyvalent product.

Both Type I serum and polyvalent serum are being supplied by the large producers so that physicians may take their choice between them. There is no special reason why the producers should prefer to advocate the use of either one in preference to the other. The choice lies with the physician, but it would seem to be more logical to use standardized polyvalent serum than the Type I serum.

In the opinion of prominent army surgeons, with whom I have talked, the use of polyvalent serum possessing antibodies to Types I, II, and III serves a better purpose than the employment of Type I serum, because it produces more or less immunity to reinfection.

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THE MEDICAL INTERPRETER

PNEUMONIA

In the light of recent reports received from Fort Sam Houston, Camp Travis, Camp Oglethorpe, and other army posts, it is far more important to find out whether the patient is the victim of pneumococcus or streptococcus pneumonia, or is suffering from a mixed infection, than it is to determine the type or types of organism responsible for the condition.

Fortunately, it is not necessary for the country doctor to secure a bacteriological diagnosis before resorting to serum or vaccine therapy in the treatment of pneumonia. Nearly all that can be obtained from serum treatment is possible to secure by conjoint use of polyvalent antipneumococcus and antistreptococcus serums. Accuracy in diagnosis and treatment may require laboratory facilities, but the country doctor, who is not in a position to avail himself of such service, need not let his patient die for the want of it. The most important thing to remember is the necessity of prompt action and the use of large initial dose (100 c.c.) and repeated injection, for the purpose of destroying the infecting micro-organisms, neutralizing their toxins, and keeping the blood sufficiently loaded with antibodies to prevent reinfection.

The Serum Treatment of Streptococcus Pneumonia. Now in relation to the serum treatment of streptococcus pneumonia, the light shed on the subject by the researches carried on at the Base Hospital, Fort Sam Houston, San Antonio, Texas, is quite illuminating.

The authors state: "It would appear that the hemolytic streptococcus was the cause of death in twenty-nine, or 94 per cent., of the thirty-one cases of lobar pneumonia included; and since this organism was found in entirely pure cultures in either serous exudates or the hearts' blood or both, in cases of pneumonia following measles, it may be concluded that the hemolytic streptococcus is the causative organism in this complication following measles; moreover, that it was

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the immediate cause of death in a large percentage of the so-called lobar pneumonia cases."

The authors conclude that on account of the unquestioned prevalence of streptococcus pneumonia, both as a complication of measles and as co-existent with lobar pneumonia, it is apparent that a new differential procedure for type identification must be devised. In none of the lobar pneumonia cases, which at necropsy showed both pneumococci and streptococci, had an ante-mortem diagnosis of type epidemic pneumococci other than Type IV been made.

Because streptococci were found in 55 per cent. of the cases, because mortality from infection by the streptococcus is high in the so-called lobar pneumonia cases, and because the streptococcus has not heretofore been recognized as an important factor in the pneumonias, the authors consider the identification of this organism in the sputum of great importance in determining the proper therapeutic treatment, and say that some of the failures of the antipneumococcic serums in the treatment of lobar pneumonia are doubtless due to the hemolytic streptococcus. Therefore, they advise that a specific antistreptococcus serum of a high titer be applied to both groups of pneumonias, believing that this will be the most effective agent in reducing the high mortality.

MacCallum says: "When *Streptococcus hemolyticus* gained a foothold it usually caused in this series of cases the anatomic complex called here 'interstitial bronchopneumonia.' This is the same whether it is preceded by measles or scarlet fever, or by other diseases, and its characters are due to the specific effects of the streptococcus, and in some cases the lobar pneumonia was complicated, anatomically, by the corresponding bronchopneumonia."

It was also observed that infection with the hemolytic streptococcus does not always cause an interstitial bronchopneumonia, but may produce a patchy lobular pneumonia.

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PNEUMONIA

The author states that "one of the most interesting features of our study of the cases in this hospital is the recognition of the invariable connection of *S. hemolyticus* with that characteristic anatomic lesion which was well known, but to which we have for convenience given the name of 'interstitial bronchopneumonia.' . . . Empyema is a practically constant accompaniment of this condition and is of extremely serious import."

The report also states that "lobar" pneumonia due to pneumococcus has been found in many cases, not especially related to the occurrence of measles, but often complicated by secondary or coincident infection with *S. hemolyticus*.

One of the latest contributions to the bacteriology of the pneumonias is the report contributed by George F. Dick, M. D., of Chicago, and published in the *Journal of the A. M. A.* It is entitled, "A Bacteriological Study of the Pneumonia Occurring at Camp Pike, Arkansas."

The study is based on sixty cases of pneumonia admitted to the base hospital during February and March. The evidence obtained by examination of the sputum was further substantiated in a number of cases by bacteriological examinations of the blood during life and of the lungs after death. This report confirmed the statements of the the other investigators quoted in relation to the frequency of the streptococcus as an etiological factor in pneumonia.

The pneumococcus cases form 48 per cent. of the sixty cases studied; of these 21 per cent. were Type I, 34 per cent. Type II, and 45 per cent. Type IV. Only one case of Type III was observed.

In 46 per cent. of the cases streptococci were the predominating organisms; of these 46 per cent. were non-hemolytic. In the cases coming to necropsy the pneumonia in which this type of organisms was found resembled the ordinary pneumococcus lobar pneumonia.

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PNEUMONIA

As stated by the author, his series of cases is interesting on account of the high percentage of streptococcus infection particularly due to the non-hemolytic organisms, which were also found associated with cases diagnosed as influenza and in the pus from appendicitis.

Vaccine Treatment of the Pneumonias. You will doubtless remember that Sir A. Wright undertook some investigations for the purpose of testing out the value of bacterial vaccines in the prophylaxis and treatment of pneumonia. These investigations were carried on in the South African gold and diamond mines. At this time the existence of definite groups of the pneumococcus, distinct and possessing specific immune reactions, had not been definitely proved, so it is not known what groups of the pneumococcus were included in the vaccines he used. However, as pointed out by the *Lancet,* the results of these investigations were valuable, as the remarkable reduction in the mortality of penumonia among the native mine-workers fully demonsrated.

The Journal of the A. M. A. informs us that Lister found that "three subcutaneous inoculations with the triple vaccine of the three groups prevent the occurrence of pneumonia as caused by members of these groups, but not the pneumonia due to other groups of the pneumococcus." From seven to ten million of pneumococci were given at each injection, the cocci being first killed by a germicide and not by heat.

The fact that Lister has apparently succeeded in preventing pneumonia caused by the pneumococcic groups of which his triple vaccine was made is certainly worthy of serious consideration. "The suggestion lies near at hand that prophylactic inoculation with the prevailing groups of pneumococci should be given a thorough trial where susceptible persons are aggregated under conditions that usually cause the outbreak of pneumonia."

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PNEUMONIA

Lister found that his own serum, following vaccination, contained agglutinins and opsonins, against the type of organism injected, eight months after the last inoculation.

Cumming, Spruit, and Lynch, to whose report I have already referred, consider it advisable to vaccinate measles patients found to be hemolytic streptococcus carriers, and also advise vaccination against the streptococcus irrespective of measles patients, because the hemolytic streptococcus is of such universal prevalence, they believe that such universal vaccination would protect against the infection, and if this procedure is carried out the case rate, as well as the mortality of the pneumonias, both pneumococcus and streptococcus, would be reduced by a large percentage. They suggest the use of a triple vaccination for this purpose, consisting of the hemolytic streptococcus and pneumococcus Types I and II.

Dr. E. C. Rosenow, of the Mayo Foundation, Rochester, Minn., reported results in the treatment of 200 cases of pneumonia with a partially autolyzed pneumococcic vaccine. In his report published in the *Journal of the A. M. A.*, he recommends that a polyvalent vaccine prepared in this manner be injected in all cases of lobar pneumonia as soon as the diagnosis can be made.

Mixed vaccines were opposed for a time by some of the specialists in vaccine therapy, also the use of stock vaccines, but more recent investigations have removed much of the prejudice. Dr. Aldo Castellani, Regius Professor of the Tropical Medicine, University of Naples, and for some time in the British colonial service in Ceylon, as director of the Clinic for Tropical Diseases and Bacteriological Institute, was one of the first to emphasize the importance of mixed stock vaccines. For a number of years he advocated the mixed vaccine of typhoid and paratyphoid A and B. Not only did he advise the use of mixtures of typhoid and paratyphoid, but also suggested

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the addition of the microbes causing cholera, plague, and Malta fever. He furnished data to show that agglutinins developed in the serum as a result of the inoculation of such mixed vaccines were not less than when the vaccines were given separately. ("Some Recent Vaccine Therapy," by Alex. Fleming, F. R. C. S.).

In a private communication, Sklopje, Serbia, from Dr. Thos. W. Jackson, a member of the commission appointed for the extermination of typhus fever in Serbia, referred to Castellani's "tetravaccine" (cholera, typhoid, and the paratyphoids) and said that it had been adopted by Dr. Richard P. Strong of the commission and also by the Serbian government. Dr. Jackson stated that more than 120,000 doses of this vaccine had already been administered without harmful results.

McCoy, in a paper appearing in the *Journal of the A. M. A.*, speaks in favor of mixed vaccines in typhoid fever. He says combined vaccines consisting of the typhoid bacillus, the two paratyphoids, the dysentery bacillus, and sometimes the cholera vibrio have been used to some extent. "There appears to be justification for the use of such combinations as preventives under special conditions."

Sir Almroth E. Wright has strongly advocated and applied a mixed "asepsis vaccine" prepared from mixed cultures for vaccination against mixed infections occurring in the wounded. According to the latest information at hand, half a million doses have been administered. . . .

Now mixed typhoid and paratyphoid vaccination is almost exclusively practiced in the army, and mixed vaccines for immunization against various mixed infections and for their treatment are quite in vogue. So it did not come to us with much of a surprise when the above reports recommending mixed vaccines for immunization against pneumonia appeared.

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PNEUMONIA

Nor were we surprised when one of our members, Dr. S. Solis-Cohen, of Philadelphia, in a paper read before the Philadelphia County Medical Society, said that at Fort Oglethorpe he had become conversant with the work of Capt. Arthur Dare and Dr. D. H. Bergey, assistant chief of the laboratory, who had put into execution at the hospital the treatment of pneumonias with a mixed vaccine and in more than a hundred cases the lobar pneumonia treated with this vaccine the death rate had been less than 6 per cent. (See Report Symposium on Pneumonia, *Medical Record,* page 743.)

In the light of the above evidence and more of the same kind that might be presented if the time limits of this paper would permit, what advice shall be given the country doctor relative to pneumonia treatment without bacteriological diagnosis? In response to this question I have received the following answers:

1. Use antipneumococcic and antistreptococcic serum conjointly, employing the polyvalent serums, assuming that the patient is probably suffering from a mixed infection.

2. Use a polyvalent vaccine made from as many strains or types of the pneumococcus and streptococcus as it is possible to obtain. Preferably employ a sensitized vaccine, because the first step in the immunizing process has already been accomplished outside of the patient's body; therefore the immunizing response is more rapid and complete; moreover, there is less likelihood of severe reaction.

3. Use both serums and vaccines in the treatment of the same patient.

4. An original suggestion of my own: Have a serum prepared by immunizing horses against mixed cultures of pneumococcus and streptococcus. I presented this suggestion to one of the best known producers of biological products engaged in the preparation of serums and was informed that the preparation of such a serum was already under way.

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Med.

PNEUMONIA, BRONCHO

In Pregnancy Treated by Caesarean Section. J. Torre y Blanco, El Siglo Medico, Madrid.

The gravity of bronchopneumonia during the later months of gestation is recognized by both obstetricians and internists. Statistics collected by Ottow show a mortality of 60 per cent. Benthin affirms that the greater part of the severe bronchopneumonias occurring during pregnancy, parturition or the puerperal state had a fatal termination; and Wollner says that bronchopneumonia is the most serious complication of pregnancy.

The writer says that most of the cases of this kind, especially in the last three months of pregnancy, in his practice have died. In many of the cases the general septic condition, more than the pulmonary lesions, produce a very grave situation from the beginning. He believes, however, that a considerable number of them can be saved by adequate treatment.

These are the cases in which the temperature is high and the prostration severe, insufficiency of the suprarenals and marked myocardial weakness, which with other phenomena produce vascular hypotension and other symptoms showing a virulent form of infection leading to abortion or to premature delivery. The severer the infection the sooner this occurs. The foetus is dead or dies within a few hours.

The occurrence of abortion or of premature delivery adds greatly to the gravity of the case and most of the patients die within a few days and some of them in a few hours. Cardiac tonics and every class of remedies tending toward the support and stimulation of the organic defenses should be employed.

Under no circumstances should the use of the influenza or antigrippe vaccine be neglected. The vaccine should contain streptococcus, pneumococcus and Pfeiffer bacilli.

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PNEUMONIA, BRONCHO

This treatment has given positive results in many of the broncho-pneumonias complicating grippe.

PNEUMONIA, LOBAR, SERUM THERAPY IN *Med.*

Dr. Graham E. Henson, Southern Medical Journal.

The cases reported in this series occurred during a period including the months February to May, 1918, at the U. S. Army Base Hospital, Camp Joseph E. Johnston, Jacksonville, Fla. They have, therefore, no relation to the pandemic of influenza which appeared in the camp the middle of the following September. The cases were not selected, but were treated in the order in which they were admitted to the hospital.

A mild epidemic of lobar pneumonia broke out in the camp in December, 1917. The hospital was still in the hands of the contractors, units being taken over by the commanding officer as rapidly as they could be made use of. We were, therefore, not prepared to conduct type determination or to do very much work. It was with certain misgivings that I adopted the policy of administering a polyvalent serum to all patients showing the classical symptoms of a lobar pneumonia. A large number of these patients seemed to derive benefit from the use of this serum. They are not included in the series about to be reported, as we were not sufficiently organized to keep accurate data. By the middle of February our organization was established, the laboratory well equipped and prepared to functionate. From this time an accurate record was kept of all cases included in this report. The potency of all serum, both monovalent and polyvalent, was at once determined by the chief of the laboratory service. He reported our Type I serum potent, but the polyvalent serum had only mild agglutinating properties to pneumococci of

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PNEUMONIA, LOBAR

Type I. It was apparent that if the value of a serum was dependent upon its agglutinins that the polyvalent serum we were using was of no therapeutic value. However, from a clinical standpoint a number of our early cases appeared to have received marked benefit from its administration. It raised in my mind the possibility of a serum containing some unknown antibody. The potency of a serum is generally determined by its agglutinating properties over the specific organism it is employed against. The series now being reported is too small to warrant much in the matter of deduction, but the clinical improvement seen in a number of cases in which an impotent polyvalent serum was employed, and the mortality rate shown in cases of Types II, III and IV, suggest the possibility of a serum containing antibodies other than agglutinins. That the clinical improvement noted in the cases referred to and that the mortality rates in cases of Types II, III and IV may have been due to entirely other causes, is not lost sight of. The construction of the hospital, where these cases were treated, with its spacious verandas, permitting all respiratory cases to be treated and kept constantly in the open, and mild and balmy climate of Florida, the age of the patients, practically all of them coming from the first draft, are factors that must be considered in a study of this kind. It is also recognized that a study of this nature without a sufficient number of controls must be considered with reserve. It was my intention, after treating seventy-five cases with serum, to treat an equal number with other means. The epidemic subsided, however, before material for controls was admitted.

Our method in caring for cases was as follows: a clinical diagnosis of pneumonia having been arrived at by the receiving officer or by one of the ward surgeons, the chief of the medical service or his first assistant was notified. Upon confirmation of the clinical diagnosis by one of these officers, the patient was removed to the

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pneumonia ward, where he was kept under the cubical system. The chief of the laboratory service or his first assistant was notified and one of these officers collected the sputum for culture and type determination. A blood culture was made at the same time, together with an absolute and differential white cell count. A specimen of urine was sent to the laboratory as soon as secured and tested for precipitins. Desensitization of the patient was at once inaugurated, the following technique being observed. The intra-dermic test was applied, 0.02 c.c. of horse serum being employed. Intra-dermic injection of sterile distilled water was used for a control. In the series eleven subjects, or 16.4 per cent., gave a positive intra-dermic reaction. These patients were desensitized by the slow method, 0.1 c.c. of horse serum being used as an initial dose, this being doubled each succeeding thirty minutes, the desensitization occupying about four hours. At the end of another hour 100 c.c. of a polyvalent serum was administered, the serum being diluted with an equal amount of normal saline. During administration, which occupied about forty minutes, the serum was maintained at body temperature. Subsequent serum therapy was dependent upon the determination of type. Cases of Type I received a Type I serum, all other types a polyvalent. All severe cases received injections twelve hours apart until a total of 1,000 c.c. of the serum had been administered. The milder cases received injections once in twenty-four hours until 1,000 c.c. had been administered, or the patient showed marked clinical improvement. Sixty-seven cases are included in the series classified as follows:

Type I. Of the twenty-two cases of Type I, nineteen recovered and three died, a mortality rate of 13.5 per cent. One of the deaths was due to an acute anaphylaxis. Of the nineteen cases recovering, eliminating one case (thirty-two) in which resolution was delayed

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thirty-five days, the average number of days before the crisis was reached or lysis was completed was 7.3. Eleven cases terminated by crisis with an average duration of 6.5 days. The shortest period before crisis was reached was three days, the longest nine days. Seven cases terminated by lysis with an average duration before lysis was complete of 9.1 days. The shortest period before lysis was completed was six days, the longest fourteen days. One case occurred in which resolution was delayed thirty-five days.

Type II. Of the eighteen cases of Type II, fourteen recovered and four died, a mortality rate of 22.2 per cent. Of the fourteen cases recovering, eliminating one case (sixty-four) in which resolution was delayed eighteen days, the average number of days before crisis was reached or lysis was completed was 7.1. Ten cases terminated by crisis with an average duration of 6.1 days. The shortest period before crisis was reached was four days, the longest nine days. Three cases terminated by lysis with an average duration before lysis was complete of 10.6 days. The shortest period before lysis was complete was nine days, the longest thirteen days. One case occurred in which resolution was delayed eighteen days.

Type III. Two cases of Type III occurred. Both recovered, the cases terminating by crisis on the fifth day.

Type IV. Of the twenty-five cases of Type IV, twenty-two recovered and three died, a mortality rate of 12.0 per cent. Of the twenty-two cases recovering, eliminating three cases which developed empyema and one case which developed into an unresolved pneumonia, the average number of days before crisis was reached or lysis was completed was 8.2. Twelve cases terminated by crisis with an average duration of seven days. The shortest period before crisis was reached was three days, the longest eleven days. Six cases terminated by lysis with an average duration before lvsis was complete

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of 10.8 days. The shortest period before lysis was completed was five days, the longest fourteen days. The three cases developing empyema were transferred to the Surgical Service, where all made uneventful recoveries. The one case of unresolved pneumonia gave a four plus positive Wassermann reaction. His temperature became normal on the twenty-eighth day. Blood cultures were conducted in the entire series. In only three cases was a positive culture obtained, one each in Types I, II, and IV. These cases all recovered and presented nothing of especial interest.

Precipitin reactions were obtained in the urine of five cases, four occurring in Type I and one in Type II. The clinical courses of these cases presented nothing of especial interest and all recovered.

Our mortality rate of 13.5 in Type I cases is not so low as that reported by Avery, Chickering, Cole, and Dochez, who report having treated 108 cases of this type with a mortality rate of 7.5. It is, however, very much lower than cases of this type treated without serum which is given by the authors cited above as 25.0 to 30.0 per cent.

Our eighteen cases of Type II show a mortality rate of 22.2 as compared with a mortality rate of 32 per cent. in cases of this type treated without serum.

Only two cases of Type III occur in the series, both recovering. The mortality rate in cases of this type treated without serum is placed at 45 per cent.

Our Type IV cases, numbering twenty-five, gave a mortality rate of 12.0 as compared with a mortality of 16 per cent. in cases of this type treated without serum.

No claims are made as to the value of a polyvalent serum in pneumonia cases of Types II, III, and IV, but it would appear to the writer that the reduction in mortality as shown in these cases

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PNEUMONIA, LOBAR

would justify this method of treatment being thoroughly tried out under proper conditions and with a sufficient number of controls before the method is discarded as worthless.

Med.

POISONING, IVY AND SUMAC

E. A. Sweet and C. V. Grant, U. S. Public Health Report.

The fact that certain species of plants belonging to the Rhus or Sumac family exert a poisonous action upon the skin of persons susceptible to their influence has long been a matter of general recognition. Inasmuch as the poisonous growths possessing this characteristic thrive in America, and are especially prolific in certain sections of the country, it seems desirable from a health standpoint to bring together the general information on this subject in order that the public may become better acquainted with the nature of these plants, methods by which they may be recognized, and the various means of preventing their toxic effects. The sum total of the incapacity and economic loss arising from this cause can scarcely be estimated, to say nothing of the bodily discomfort which commonly ensues, but certainly they are sufficient to justify a more widespread knowledge of the practical aspects of the Rhus problem.

Description of the Plants

The native forms of Rhus which produce skin eruptions belong to several species distinct botanically, including the vines and shrubs known as poison ivy and poison oak, and also the poison sumac shrub or tree. Despite their variety of form these plants are closely related and possess certain prominent peculiarities by which they can usually be distinguished without difficulty, so that by acquiring some slight knowledge of the characteristic appearance of their leaves, fruit,

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winter buds, and of their habit of growth, one may readily avoid them at all seasons of the year.

Poison Ivy and Poison Oak

Poison ivy and poison oak occur as woody perennial vines or as low erect plants, or trailing shrubs, and are most readily distinguished by their leaves, which are always divided into three leaflets, and by their smooth, whitish, waxy fruits, which resemble mistletoe berries in appearance, but vary in size from one-eighth to one-fourth of an inch in diameter and contain a single stony seed. Of the various names applied to these plants in different localities the commonest are poison ivy, poison oak, mercury, picry, climbing or trailing sumac, and poison vine. For purposes of recognition and consideration with respect to their poisonous properties, the several botanical species may be included under one general description, although great variations in character of growth and in the forms of the leaflets are found, in many instances even on individual plants.

While the names poison oak and poison ivy are used interchangeably, the term poison oak is often restricted to plants with an erect or bushlike habit of growth and with leaflets resembling certain types of oak foliage. Thus the plant generally known as poison oak throughout the Pacific coast region from Lower California and Arizona to Canada, occurs as a bush, sometimes attaining a height of four or five feet, and has leaflets resembling leaves of the western oaks; but it is also found growing as a vine, and is sometimes called poison ivy. In the East, from New Jersey, Delaware, and Virginia, south and southwestward, the name of poison oak is often used to distinguish from the poison ivy vine, a form growing as a bush, with lobed leaflets somewhat suggestive of leaves of scrub oak; while westward from Minnesota, Nebraska, and Arkansas, to Washington,

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POISONING, IVY AND SUMAC

Montana, Colorado, and New Mexico, this name is applied to a low bush or trailing shrub form which does not climb.

Familiarity with any one of the forms will enable even the careless observer to recognize poison ivy or poison oak wherever encountered, whether as a vine, trailing shrub or bush, or at least to avoid readily all plants bearing a suspicious resemblance to it. The vines attach themselves to trees, walls, fences, rocks, or any adjacent support by means of aerial rootlets, and are without the twining tendrils found on many climbers. They sometimes climb to the tops of the highest trees, and are occasionally found with stems three or four inches in diameter. The forms growing as erect bushes, or shrubs with trailing underground roots, usually attain a height of a few inches to about three feet, but in favorable situations are often found as bushes of luxuriant growth four or five feet high. The leaves of all forms have stout, rather long stems, bearing three leaflets, two of which are opposite and short-stalked, while the third or terminal leaflet is long-stalked. The leaflets are from one to four inches long, dark green on the upper surface, lighter, sometimes with a velvety covering of fine hairs underneath, with smooth or more or less indented margins, and of variable forms.

The tendency of the leaflets to form irregular, notched, and indented margins is an aid to the identification of the plants; and in forms with generally smooth margins, a deep notch or several indentations on one side of the leaflets are characteristics which often serve to confirm the identification.

Small, inconspicuous, yellowish-green flowers, borne in loose branching clusters about one to three inches long, growing out of the angles between leaf stalks and plant stem or above scars along the sides of the branches, appear in early summer and are followed by the

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small, globular, smooth, green fruits which become white or ivory color as they ripen.

These waxy fruits, which remain on the plants until late in the winter, are about one-fourth of an inch in diameter in the commoner forms. They are globular in shape, sometimes flattened or lopsided, and with the advance of the season have a tendency to dry and wrinkle, often losing their thin outer coating and revealing the single deeply grooved stone which they contain.

Poison ivy or poison oak in one or various forms infests practically all parts of the country except mountain elevations above about 6,000 feet and arid lands. It is found in fields, pastures, woodlands, and thickets, along roadways and streams, often also in city parks, cemeteries, and suburbs, sometimes mixed with other shrubbery in such a manner as to escape observation until attention is attracted to it by the occurrence of cases of poisoning. It adapts itself to the greatest variety of conditions, spreading through deep hollows and ravines, flourishing in dry soil and on hillsides, often spreading by underground roots from which small, erect shrubs arise, and showing the tendency to ascend trees or any support encountered in its growth. Its highly attractive foliage, which is red when the young leaves first unfold, becoming green with the advance of mild weather, and turning in autumn to beautiful shades of scarlet and orange, has led to its being preserved to some extent as an ornamental vine or shrub, and at times to the collection of its foliage by persons ignorant of its identity and injurious properties. Many cases of poisoning result in this way.

In the Eastern states, and westward as far as Wyoming and Texas, the Virginia creeper is found generally in the same localities as the poison ivy vine, which it resembles somewhat in its habit of growth and in the shape of its leaflets. Probably because of this

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resemblance it has occasionally been reported as a source of ivy poisoning, but it is harmless to the touch and is readily distinguished from poison ivy by the fact that its leaves are divided into three to five leaflets to a stalk. Moreover, though it is sometimes supported by aerial rootlets like poison ivy, it has also numerous tendrils like those of vines of the grape family, of which it is a member, and its fruits, which are inedible, are blue in color, have red stems, and contain two or three seeds.

The fragrant, or sweet-scented, sumac, and the ill-scented sumac are Rhus shrubs with trifoliate leaves, resembling forms of poison ivy so closely that they may not be readily distinguished in some instances. Both differ from the poisonous Rhus species in their flowers, which appear in dense spikes before the leaves, and in their red fruit; they also differ in the aromatic properties indicated by their names. The fragrant sumac is found in rocky woods from Canada to Florida, and westward as far as Minnesota, Kansas, and Louisiana, while the "skunk bush" occurs from Illinois and Texas westward to Washington and California, growing in dry soil.

Poison Sumac

Poison sumac grows in moist ground, usually in swamps or along low, miry banks of streams and ponds. It occurs from the New England states south as far as Florida, and westward to Minnesota, Arkansas, and Louisiana, and is known under various local names such as poison dogwood, poison elder, poison ash, thunderwood, and poisonwood. It frequently grows as a tree ten to twenty feet high, and may attain a height as great as thirty feet, with trunk five to ten inches in diameter; but it is more abundant as a shrub, with several slender, clustered stems. The trunk has smooth, light-gray bark, while the young twigs are reddish brown when they first appear,

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turning to orange brown by the end of their first year, and the older branches have the gray color of the trunk. The leaves are about seven to fourteen inches long, and consist of a slender stalk bearing seven to thirteen leaflets, arranged opposite one another in pairs, with a single usually long-stemmed leaflet at the end, those at the side being attached to the stalk by short stems. The leaflets, which are of an elongated oval shape, with entire margins, attain a size of three to four inches long and one and one-half to two inches wide. When they first unfold in the spring they are of a bright orange color and have a velvety covering of minute hairs, especially along the margins and underneath. This covering soon disappears. At maturity the leaflets are dark green and glossy on the upper surface, with prominent scarlet midribs, and lighter green underneath. Early in summer minute yellowish-green flowers appear in narrow clusters, about three to eight inches long, growing out of the angles of the leaf stems near the end of the branches, and are followed by shining ivory white or yellowish fruits, globular in shape but somewhat longer than thick, about one-fourth inch in diameter, resembling those of poison oak and poison ivy already described, and containing a single yellow grooved stone. The foliage turns early in autumn to brilliant red, orange, and russet shades. The leaves fall early; but the drooping, long, slender clusters of pearly fruit remain, often until the following spring, and, with the light gray bark and pointed purplish winter buds, are means of identifying poison sumac in its winter state.

Those persons having little familiarity with the identity of trees and shrubs occasionally confuse poison sumac with the harmless sumacs, certain species of ash, elder, and various other shrubs and trees bearing somewhat similar foliage. They also confuse it with dogwood to which it bears no resemblance. The poison sumac leaves

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are, however, readily distinguishable from all of those plants, while the difference in character, appearance, and color of the fruits is such as to enable one to exclude them without difficulty. It is well to remember also that the poison sumac occurs on moist or swampy land, and in drier locations it is found only along the borders of swamps and bogs or where the ground is wet during part of the year.

Its loose, drooping clusters of flowers, and later of ivory-white fruits, are entirely different in appearance from those of the harmless sumacs of the region in which it grows. These latter produce flowers and fruits on densely covered upright terminal spikes which are of a conspicuous red shade in the fruiting stage. Aside from conspicuous differences in form, the number of leaflets into which the leaves of the harmless sumacs are divided, which ranges from nine to twenty-one and thirty-one in the commoner species, as compared with seven to thirteen in the poison sumac, is a further aid in distinguishing them.

The statement that native forms of sumac with red fruit are harmless should, perhaps, be qualified with respect to a rare form occasionally found from North Carolina to Georgia, and which has been reported as poisonous by various writers and declared harmless by others. This is a low shrub one to three feet high, spreading by underground roots. Its leaves are twelve to fourteen inches long, and consist of about eleven broadly oval leaflets about two and one-half inches long and one and one-half inches wide, stemless or very short stalked with the exception of the terminal leaflet which has a stalk three-fourths of an inch long with winged margins. Its flowers are produced in dense clusters at the ends of branches, and its fruit is bright scarlet when ripe, and covered with fine silky hairs.

A near relative of the above-described forms is the poisonwood or hog gum-tree of the West Indies, also known as coral sumac, which occurs in the hammock lands of southern Florida. Its sap is

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said to be dangerously poisonous to touch, and inflammation of the skin is reported to have been caused by mere proximity to the plants. The plant is usually seen as a small tree, but sometimes attains a height of over thirty-five feet, with short trunk two feet thick. The bark is of a reddish brown color, separating into plate-like scales, between which the bright orange color of the inner bark is seen, and marked by dark spots caused by exudations of a resinous gum. The gum of this tree, collected by incising the bark, is employed medicinally to some extent as an emetic, diuretic, and purgative. The leaves are nine to ten inches long and consist of a stout stalk, thickened at the base, bearing five to seven (or sometimes three) oval or almost heart-shaped leaflets one to four inches long. The leaflets have short stalks, are glossy green on the upper surface and dull underneath, and have smooth margins. The tree produces small yellowish-green flowers in clusters about ten inches long, followed by bright orange-colored, oblong, one-stoned fruits about three-fourths of an inch long.

Nature of the Poison

The various toxic species of Rhus apparently cause skin irritation through the same toxic principle. The nature of this poison has long been a matter of study, but it now seems to be established that it is an oily principle, called toxicodendrol, which can be extracted from the leaves, roots, flowers, green fruits, and in fact all parts of the plant with the possible exception of the pollen and ripe fruit. Experiments have shown that the minutest quantities of this oil can produce poisoning. Consequently, contact of the body with the growth, however slight, may result in the transference to the skin of enough of the poisonous principle to exert its poisonous effects. It is not necessary that this contact should be direct, as an intermediate

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object can transfer the poison to the skin; for example, articles of clothing or farm implements which have brushed against the plants may be later handled, thus giving rise to poisoning, and the possibility of contracting it from horses, dogs, or other animals which have been in contact with the plants should not be overlooked.

While there is reason for believing that the nonvolatile toxicodendrol is the sole toxic principle concerned, it was formerly supposed that the Rhus poisoning was caused by volatile emanations from the plants, and there is still much diversity of opinion concerning the matter. Apparently authentic cases of Rhus poisoning which appear to have originated without direct or indirect contact with the plants have been reported. Many persons who know the plants and are careful to avoid them are convinced that they have been poisoned by passing by them or observing them from a short distance. Cases of this kind are sometimes attributed to transference of the poison by minute particles or other dust from the plants, possibly pollen or leaf hairs, which might be borne through the air for considerable distance. Although it seems to have been shown conclusively that the poison is not formed or normally contained in either pollen or leaf hairs, this does not exclude the possibility that they might take it up by coming in contact with other parts of the plant. It is probable, however, that many cases supposed to have originated in this way have actually been due to direct or indirect contact. The exact manner in which the poisoning has occurred may readily be overlooked, since in many instances the appearance of the eruption is delayed for several days and traces of the poison sufficient to produce injury may be conveyed by clothing or other articles long after contact with the plants. Numerous attempts to produce poisoning experimentally by emanations from Rhus plants, and from the oil itself, have been unsuccessful. On the other hand, there is excellent foun-

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dation for the popular belief that smoke from the burning plants will give rise to irritation, and some of the worst cases of Rhus poisoning undoubtedly originate in this manner.

Taken internally in toxic doses, the plant is reputed to have the properties of a violent irritant and narcotic poison. Cases of poisoning of children from eating the fruit have been reported. Horses and cattle eat poison-ivy foliage freely, apparently without any ill effects, at least from the relatively small amounts consumed under usual conditions.

Susceptibility

It has long been a matter of observation that certain individuals possess a marked degree of resistance to the action of Rhus toxin. It is not strange that they should thus come to regard themselves as immune, although there is good reason for believing that absolute immunity does not exist. Experiments with persons of this type have shown that when they are subjected to prolonged exposure, or to the application of the toxic principle of the plant itself they react to some degree and are, therefore, not immune.

That varying degrees of susceptibility to the poison exist, there can be no doubt, but here again we are on treacherous ground, as a person may be repeatedly exposed without noticeable symptoms only to have his pride humbled upon a subsequent exposure. Some individuals are not ordinarily susceptible to ivy but do react to sumac. Since the poison in the two plants is apparently the same, the difference is explained by the fact that the sumac generates and distributes the toxin in larger quantities than does the ivy. Likewise, certain individuals claim to be insusceptible to the leaves but admit that the smoke, which contains a finely divided but heavy dosage of the toxin, causes symptoms. The rule can be offered that whenever a large

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amount of toxin is deposited upon the skin, and the person is markedly susceptible, the reaction will be severe, whereas if the dosage is small and the susceptibility slight, the reaction will be mild, in fact so light in some cases as to be unnoticeable. The actual contact with the plant may occur in such a way as to cause little or no transference of the toxin, and consequently no noticeable effects in an individual who on another occasion may be severely poisoned through acquiring a heavier dosage, particularly from freshly bruised stems or leaves.

For the same reason the plants are most poisonous in the spring and summer when their acrid juice is abundant, although they retain their poisonous property even long after drying, and injury from old herbarium specimens is not uncommon. Certain local conditions, such, for example, as the thickness of the integument, and the state of the skin as regards perspiration at the time of exposure or subsequent thereto, may serve, however, to modify the irritation.

Symptoms

The time elapsing between exposure and the earliest manifestation of symptoms varies from a few hours to five days or even longer, depending upon the susceptibility of the individual, the degree of exposure, and the amount of resistance of the parts involved.

The hands, forearms, and face are most often attacked, as they are especially subject to exposure. The feet and legs of barefoot children, for manifest reasons, also afford a favorite site for the eruption. Other regions of the body, such as the trunk, the genital organs of males, or the breasts of females, often become involved either as a result of direct exposure or the conveyance of the irritant to these parts by the hands, clothing, or through bathing. A tub bath is frequently the means of disseminating the irritant to sections of the body other than those primarily affected, and the disease in exceptional

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instances may even originate from contact with the clothing or skin of some other person, so that in a sense it is "catching."

The symptoms of an ordinary attack of Rhus poisoning vary considerably. The earliest evidence of trouble is a slight itching or burning sensation. As the inflammation develops, the itching and burning becomes more intense, at times causing marked annoyance and even disturbance of sleep. Scratching affords partial relief, but inasmuch as the inflammation is aggravated in this way and the poison may be distributed to unaffected sections, it should be resisted. Occasionally, patients of some phlegmatic type will be met with who make little complaint of either itching or burning, but usually these are the most distressing symptoms. In severe cases, or when infection by pus germs has occurred, actual throbbing pain may be present, especially in dependent parts.

The skin eruption shows wide diversity. It may consist merely of reddening of the involved surfaces, accompanied by swelling, the redness being in proportion to the degree of inflammation. More often small vesicles, containing serum, develop, usually in streaks or patches. The coalescence of several of these spots results in the formation of blebs, or blisters, which may cover a square inch or more of surface. When these serum-containing lesions rupture, their contents are discharged, producing a moist or weeping effect, such as is often seen in acute eczema. In moderately severe cases, pustules form, the pus pockets resulting from the entrance of germs which are normally present upon the skin or which have been introduced by scratching. Scab formation in the latter stages is common. Any or all of these lesions may accompany the inflammation so that the skin frequently presents a decidedly angry appearance. After the subsidence of the inflammation, peeling of the integument occurs, the layers of the skin often coming away in large patches, leaving a

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denuded surface of the skin beneath. The desquamation takes place within from a few days to a week or more after recovery, and may, in mild cases, be so slight as to escape observation.

Swelling and edema of the parts involved nearly always occur. If the tissues making up the inflamed area are lax, as for example about the eye or scrotum, the swelling is apt to be pronounced, quite commonly one or even both eyes may be entirely closed, the ear may become twice its customary size, the lips distorted, and other parts have their normal lines obscured. The swelling usually terminates as rapidly as it develops, and should not, under ordinary conditions, occasion undue alarm.

In certain complicated cases, where the invasion by pus germs is particularly severe, small abscesses may form. Such cases are accompanied by enlargement and tenderness of near-by glands, by pain, fever and other evidences of constitutional disturbance. In rarer instances ulcers develop; complications of this character are apt to be followed by scars. Ordinarily, however, the disfigurement from Rhus poisoning is but temporary, the skin soon regaining its normal color and appearance. Occasionally when a person is exposed to the irritant at frequent intervals, a more or less chronic inflammation of the skin resembling eczema develops, and the sufferer is quite at a loss to know the source of his trouble.

On the whole, the skin eruption resulting from Rhus poisoning does not differ materially from that caused by a number of other irritant poisons, as, for example, such chemicals as bichloride of mercury, arsenic, and certain aniline compounds contained in dyes. It is well to know that identical effects are also sometimes produced by urine, pus, and other irritant bodily discharges. The seasonal prevalence of the inflammation, the history of exposure, and the fact that Rhus poisoning is much more common than that brought about by other agents, will give a clue to the character of the disturbance.

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POISONING, IVY AND SUMAC

Prevention

Much can be accomplished toward the protection of persons who come in contact with Rhus vines, and also in preventing or lessening the disastrous effects following exposure. Toxic plants can usually be handled with impunity if rubber gloves are worn, provided none of the dust or irritating material comes in contact with the body. Care should be exercised in removing the gloves from the hands, as they necessarily will harbor the toxic material and any contact with the skin is apt to cause trouble. After the gloves have been removed they should be thoroughly washed with soap and water, rinsed several times, and laid away. The water in which the infected gloves are washed will naturally contain the poisonous principles, hence it may not be entirely innocuous. Ordinary thick gloves of firm texture, with gauntlets to protect the wrists, may be used in place of rubber gloves, but the protection afforded is not always absolute. Inasmuch as clothing which has come in contact with the leaves may serve for an indefinite period to convey the infection, a change of garments following exposure is to be recommended, this change to include shoes, which perhaps more often than any other article are a source of indirect contagion. The anointing of the parts to be exposed with cottonseed or olive oil, or vaseline, is said to serve as a protective means of considerable value. The oil must later be completely removed by repeated washing.

In some localities the belief is prevalent that eating poison ivy leaves in the spring will confer immunity during the year, but this seems at best a dangerous experiment and severe cases of poisoning contracted in this manner have been reported. In the present state of knowledge of the subject, therefore, it is believed that attempts to confer immunity by the ingestion of leaves or extracts of the plant should be undertaken only under the guidance of a physician.

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POISONING, IVY AND SUMAC

One of the surest and best methods of individual prophylaxis is the use of soap and hot water. It has been found that the Rhus poison after being deposited upon the skin requires a certain time for penetration, and if this penetration can be prevented, irritation and the resulting eruption will not occur. Hot water and soap act mechanically, and if judiciously used constitute by far not only the most serviceable preventive but also one of the best curative agents which we at present possess.

The washing should be done as soon after exposure as possible. If considerable time has elapsed—that is, from 12 to 24 hours—this method should be adopted in the hope that at least a portion of the material which has not had time to penetrate will be removed. A soft brush, or better, pieces of gauze, should be used, although there is no objection to a wash rag, provided several are available. Much harm can be done with a stiff brush vigorously wielded, as in this way the minute particles of toxic material may be driven further into the superficial layers of the skin, resulting in more acute and pronounced inflammation than otherwise would have occurred. A heavy lather should be produced and the washing continued for four or five minutes. Several pledgets of gauze should be used, each being discarded in turn, in order that the poison may not be distributed by the cloth. For the same reason the water should be changed frequently, or running water used. To obviate the danger of disseminating the poison to unaffected parts, only the exposed or diseased area should be immersed, if this is feasible. After drying the area, it is well to repeat the process in four or five hours. Alcohol exerts a solvent action upon the toxin and can be similarly used, care being taken to flush the parts with an excess of the liquid. The alcohol should first be diluted with an equal quantity of water. Ordinarily if either of these procedures

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is carefully followed, much if not all of the toxic material will be removed and the inflammatory reaction prevented or greatly lessened.

Where the exposure has been more general, a bath of the entire body, with the exercise of the precautions mentioned, followed by a change of clothing, is a good preventive measure. The hair should not be neglected. A shower is to be preferred for the reason indicated, but if this is not practicable, the water in the tub should be changed at least twice. Bathing, if improperly performed, may result in the appearance of the rash on parts of the body not at first involved, although this secondary eruption is usually less intense than that at the original focus.

Handling of the body should be discouraged. Even in those cases where the hands are not involved they are liable to harbor the toxin, hence it is easy to understand why their movements should be restricted. This will be difficult with children, and most adults will meet with considerable inconvenience in the observance of this prohibition. Freedom of movement is without danger if the hands are properly scrubbed.

Treatment

If the treatment previously outlined fails to prevent the development of the skin poisoning reaction, it is still possible by intelligent effort to alleviate in large measure the distressing symptoms. Before undertaking measures for relief, one should remember, however, that any treatment for disease is more intelligently administered by a skilled physician than by a person unskilled in medical knowledge. It is also well to recall that what is indicated in one case may be contraindicated in another, and that a particular stage of a disease may, and often does, require treatment which would be disastrous were it instituted at a later period. For these reasons, therefore, it is desira-

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ble in serious cases to secure competent medical advice, if such is obtainable, and to follow strictly the directions given. When for any reason this is not feasible, the following treatment is recommended:

If the skin is highly inflamed or the eruption extensive, it is advisable to keep the patient in bed, as rest of an inflamed part invariably hastens cure. Exposure to the sun during hot weather increases perspiration and aggravates the inflammation, hence is to be avoided. The comfort of the patient will be increased if the clothing is thin, the bedding light, and the room kept cool. Care should be exercised to see that no part of the clothing irritates the inflamed area. It is well to maintain the bowels moderately free; for this purpose a Seidlitz powder before breakfast, as necessary, is beneficial. Summer weather diet—that is, plenty of fruit, cool drinks, and frozen desserts—is indicated, particularly if moderate fever accompanies the inflammation. Should this or other constitutional symptoms, such as pain, headache, or loss of sleep, be present, suitable remedies are to be prescribed by the physician.

For the eruption itself, scores of remedies and numerous favorite prescriptions—many of which are claimed by their advocates to possess distinctive virtues, if not specific qualities—have been recommended. In spite of these claims it is necessary to state that no specific treatment for Rhus poisoning is yet available. The very multiplicity of preparations recommended, ranging in character from brine to brimstone, and also including the juice of at least twenty different plants, in itself constitutes reasonable proof of the correctness of the above statement. The irritation is in its nature self-limited, usually requiring only a week or ten days for its entire subsidence, hence it is easy to understand how numerous so-called cures have arisen.

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POISONING, IVY AND SUMAC

For the relief of itching nothing is better than the immersion of the inflamed surface in hot water for several minutes, gradually increasing the temperature until the water is as hot as can be borne. If the eruption is on the face, the hot water can be applied by means of a thick towel. As previously mentioned, the soap-and-water treatment is distinctly curative in those cases where all of the poison has not penetrated.

It is better that the inflamed area should be left exposed to the air rather than tightly bandaged. If the bandages are kept moist with a solution of cooking soda or borax (a teaspoonful dissolved in a cup of water), or with other solutions to be mentioned, there is no objection to their use. In any event they should be frequently changed, more especially when pus has formed, or when the secretion is excessive.

Ointments, in the acute stage, should not be used; compounds with a fatty base serve to scatter the toxic oil and thus tend to aggravate rather than relieve the inflammation. In the latter stages of the disease, after the toxic material has exhausted itself and a certain amount of inflammatory reaction still persists, soothing or astringent ointments are of value.

Hot solutions of permanganate of potash (of 2 per cent. strength if the skin is intact, but only half as strong if the skin is broken) have been much in vogue. The drug is thought to exert a direct action upon the poison in much the same manner as vinegar counteracts the effect of an alkali. One disadvantage of permanganate is that it stains the skin a mahogany brown of greater or less intensity; but this stain in time will wear off, or it can be immediately removed by the application of lemon juice.

A 10 per cent. solution of hyposulphite of soda, photographer's fixing liquid, applied as a wet dressing, gives in many instances bene-

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POISONING, IVY AND SUMAC

ficial results. A similar solution of sulphate of magnesium, Epsom salts, is entirely harmless and allays the inflammation as satisfactorily as most other remedies. A lotion made of one part of the fluid extract of Grindelia to ten parts of water, introduced as a specific, has likewise been extensively used with varying results. Since applications of solution of sugar of lead, a favorite treatment in earlier days, generally prove disappointing after the inflammation has developed, and involve the risk of lead poisoning if used over extensive areas, they are not recommended. If used in the early stages it should be remembered that lead salts precipitate the toxin and the treatment should, therefore, be followed by washing to remove any traces of poison thus deposited.

The blebs or blisters, if fully developed, should be opened with a sterile needle and the clear serum expressed with a pledget of absorbent cotton. This serum is harmless and does not spread the infection to uninvolved areas. The integument, however, should not be removed until the new skin beneath is well formed and its sensitiveness diminished. In the late stages the application of a mild boric acid or zinc ointment hastens the cure.

Med.

PYORRHEA ALVEOLARIS

Pyorrhea Alveolaris. Dr. S. Tyrrell. Therap. Gazette, Detroit, No. 10, 690.

The author is a strong supporter of Dr. McNulty's claim that pyorrhea alveolaris is an error of metabolism and that saline balance is essential to body well-being, but he goes still farther and says that in pyorrhea alveolaris we generally find excessive deposits of the biurate of sodium in the urine which points to the circulation of the biurate in the blood which by its irritating properties sets up inflammatory

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PYORRHEA ALVEOLARIS

action and deposits in many parts of the body including the gums. The treatment, in Dr. Tyrrell's opinion, should be purely medical. He carries out the following method:

He gives a two-grain tablet of calomel every night for a week, taking care that the dose is carried away the next day. He then administer 15 grains of salicylate of sodium three times daily in order to eliminate the biurates in greater quantities. The patient is put on a diet of cereals and milk. This treatment is always successful. To prevent a recurrence of the condition it is often necessary to order a two-grain tablet of calomel with soda once a week and see that the patient gets plenty of soda in his food. Frequently, also, a dose of 20 grains of the salicylate of sodium should be given in a tumbler of water at bedtime.

Med.

RADIUM THERAPY

Contribution to the Study of the Internal Use of Radium and Its Emanation. (Contribution à l'étude de l'emploi interne du radium et de son émanation.) Dr. G. Bardet. Bull. gén. de thérap., Paris, No. 15, 653-659.

The author has used an injection of an isotonic solution of radium in a case of puerperal septicemia with complete success. The patient was in a very serious condition. Temperature rose to 40° R. Intravenous injections of electrargol with curettage of the uterus brought no improvement. Death was imminent. As a last resort an intravenous injection of an isotonic solution containing 100 microgrammes (1/10 of 1 milligramme) of radium was administered. After the injection the temperature rose still higher, probably due to an increased elimination of urea. On the following day the temperature fell rapidly. The patient regained consciousness. In a few days fever disappeared entirely, the appetite returned, and the patient was completely cured.

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Med.

SCARLET FEVER—ITS PREVENTION AND CONTROL

J. W. Schereschewsky, U. S. Public Health Service.

Scarlet fever, like the poor, is always with us to a greater or less extent, and it is deemed worthy of interest to bring out the important points in its prophylactic and curative management embraced in this most excellent paper.

Scarlet fever is regarded, by the informed, as one of the dreaded diseases of childhood, not only because an attack may be so malignant as to cause death in a short time, but also because of its high degree of infectiousness, the many and grave complications with which it may be attended, and because the hope of recovery, even in cases apparently mild at the outset, has proved too often illusory.

As we are yet without specific remedies against scarlet fever, our reliance for its mastery must lie in its prevention. This pamphlet is therefore addressed to the general public, whose intelligent co-operation is necessary in all preventive measures against diseases, in the hope that it will aid, in some small degree, in spreading that knowledge of communicable diseases which should be in the possession of every citizen to enable him to do his share in their prevention.

Occurrence of Scarlet Fever. Scarlet fever is more especially a disease of temperate climates. In Europe it is more generally prevalent in England and Germany, in which countries it is always present and frequently epidemic. In the United States it affects particularly the Northern states, being more prevalent there than in the South. It is also a city rather than a rural disease, some two-thirds of all the deaths from scarlet fever in the registration area of the United States, in 1912, having occurred in cities. (About 46 per cent. of the population of the United States live in cities.)

Scarlet Fever and Season. Scarlet fever prevails during the colder months of the year. With the opening of the schools, the

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SCARLET FEVER

autumn months are always signalized by the marked increase in the number of cases of scarlet fever reported to health offices, each month showing a progressive increase until a maximum is reached in December and January. Only a small decline in the number of reported cases is shown in the spring months, but in July and August there is a great falling off, the number of cases reported being very much less than in the winter months.

Age and Scarlet Fever. While scarlet fever may attack persons of any age, not even the very old being exempt, it is primarily a disease of infancy and childhood. The susceptibility to the disease becomes rapidly less with increasing years. From the figures for 1915, published by the Bureau of the Census, over 49 per cent. of the total deaths from scarlet fever in the registration area of the United States took place in children less than 5 years old, over 78 per cent. in children less than 10, over 89 per cent. in persons less than 25 years of age.

On the other hand, very young infants do not seem very susceptible to contracting scarlet fever. The disease is seldom seen in infants less than 7 months old. The disease, however, is very fatal to infants if they are attacked. The greatest susceptibility to scarlet fever falls between the second and ninth year, over 60 per cent. of the deaths from scarlet fever taking place in this age period.

The Cause of Scarlet Fever. We are still ignorant of the specific germ which causes scarlet fever. We do find, however, that infection with the scarlet fever germ is, in the great majority of instances, accompanied by infection with certain pus germs (streptococci). The virus of scarlet fever, when it enters the body, seems to weaken its natural resistance to the pus germs which are always present upon the skin and in the mouth, nose, and throat, so that these seize the opportunity to invade the system, the defenses of which

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have been sapped by the action of the scarlatinal virus. Most of the complications of scarlet fever are due to the action of these pus germs.

Vitality of the Scarlet Fever Germ. The scarlet fever germ displays great tenacity of life. It seems to cling to whatever objects it encounters. In no other disease has the infection been apparently conveyed with such frequency by objects which have come in contact with those ill from scarlet fever, such as clothes, books, toys, and the like.

The virus is readily destroyed by heat; with less readiness by disinfectant solutions.

The Symptoms of Scarlet Fever. Some description of the symptoms of scarlet fever is desirable so that all may be on their guard against the disease. Its principal symptoms consist in sore throat, fever, rapid pulse, the breaking out of a bright red rash (from which it takes its name) over the body and extremities, and usually swelling and tenderness of the glands of the neck. These symptoms are followed by a stage known as the period of desquamation, or peeling, during which the outer layers of the skin are shed in scales, flakes, or patches.

We can distinguish three well-marked stages in the course of an attack of scarlet fever:

1. The period of invasion.
2. The period of eruption.
3. The period of desquamation.

Period of Invasion. The disease strikes suddenly. A child, hitherto apparently in the best health, is seized with sore throat and fever, very often with vomiting, and, in infants, convulsions. The fever mounts rapidly, the skin feels unusually hot and dry to the touch, the tongue is furred, the throat parched, the face flushed and somewhat bloated. Cough and running of the nose are unusual. This stage usually lasts twenty-four to thirty-six hours.

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SCARLET FEVER

Stage of Eruption. The rash usually appears on the second day, but may be deferred for forty-eight hours. On the other hand, it may begin to come out a few hours after the first symptoms. It appears first on the neck and chest as a breaking out of fine, scattered, bright points implanted on a scarlet flush. It spreads rapidly, so that by the evening of the second day the entire body may be covered. The eruption at its height has a vivid scarlet hue quite unlike that seen in any other eruptive disease. The rash is more marked on the inner surfaces of the arms and legs and where joints make folds of the skin, as in the groins and at the elbows.

In some cases the rash is patchy instead of uniform, with islands of normal skin. At other times tiny elevated patches appear, as in measles, but this is not so common as in the latter disease.

In malignant attacks bleeding may take place in the skin, causing large purplish patches.

After persisting at its height for two or three days the rash gradually fades, the fading being accompanied by a progressive fall of the fever.

Period of Desquamation or Peeling. With the fading of the eruption and the fall of the fever the skin looks stained and feels rough. Gradually its outer layers begin to be thrown off, the process usually beginning about the neck and chest. The amount of peeling usually bears some relation to the previous intensity of the rash. When this has been vivid and its duration prolonged, large flakes and patches come away. Rarely the nails and hair are shed. On the other hand, with mild eruptions the peeling may be much less marked, consisting of bran-like particles only. The entire process lasts ten to twenty days.

Throat Symptoms. Inflammation of the throat is a prominent symptom in scarlet fever. This is present in various grades and may

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vary from redness of the hard palate and inner surface of the cheeks, with some swelling and more vivid redness of the soft palate and tonsils, to the condition known as "diphtheroid," with much increased swelling and inflammation of the tonsils and neighboring parts, with extensive formation of a membrane over the tonsils and soft palate.

In these severe cases extensive membrane formation in the throat may lead to death of the underlying tissues, so that large sloughs form. The swelling of the glands and soft parts of the neck may be so extensive that breathing is interfered with and death ensues from suffocation, or deep abscesses form, endangering life and markedly prolonging convalescence.

The Tongue in Scarlet Fever. The tongue in scarlet fever has a characteristic appearance. At the outset of the disease it is coated with white, the edges being red. The little papillae or prominences with which the tongue is studded, emerge through the white coating and can be seen as little red points dotting the white surface.

Somewhat later in the disease the white coating disappears, leaving the tongue rough and red, often glazed. The papillae remain considerably swollen, and this, together with the beefy appearance of the tongue, constitutes a condition characteristic of scarlet fever, which the writer describes as the "raspberry tongue." The breath in scarlet fever often has a peculiarly heavy, sweet odor.

Types of Scarlet Fever. Scarlet fever shows marked variations in its severity. There are mild or abortive cases in which the rash is scarcely visible, or in which the sore throat and the "raspberry tongue" may be the only signs of the disease. In certain epidemics, particularly in schools, this type of the disease may constitute over a third of the cases.

On the other hand, the symptoms may be so severe that the patient, overwhelmed by the poison of the disease, may die within

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twenty-four to thirty-six hours, with high fever, great restlessness, delirium, and convulsions.

In other cases the throat symptoms are prominent and may be of the utmost severity. Rapid and thick membrane formation takes place which may extend into the interior of the nose, and into the ears through the Eustachian canals (openings of the ear into the throat). Death may ensue from suffocation, due to the swelling of the soft parts, or gangrene may set in, causing a fatal issue. Convalescence may be much delayed by persistent enlargement of the neck glands and the formation of deep abscesses in the neck, or by purulent discharges from the nose.

The Complications of Scarlet Fever. Scarlet fever is distinguished by the variety and severity of its complications, which may develop in cases apparently mild at the outset. The most common of these are inflammation of the kidneys (nephritis), ear complications (middle ear disease), inflammation of the lining membrane of the heart (endocarditis), inflammation of lymph glands (adenitis), and joint affections. Of these, nephritis and ear complications are by far the most common.

Inflammation of the Kidneys (nephritis). Inflammation of the kidneys may develop, usually in the second or third week of the disease, even in the mildest cases. The symptoms vary greatly in severity from instances in which the condition is shown only by the presence of albumen in the urine, pallor, and slight swelling of the eyelids and feet, to those of greater severity with scanty urine loaded with albumen and general swelling of the body, or to the severe and rapidly fatal cases with scanty, bloody urine or urine completely suppressed, with vomiting, convulsions, and loss of consciousness.

Ear Complications. These are very common. They are caused by an extension of the throat inflammation to the interior of the ears

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through the canals by which they open into the throat. The inflammation may extend to the bony cells of the temporal bone behind the ear, causing mastoid disease; the hearing may be destroyed, or the inflammation may extend to the brain, causing dangerous brain complications. The ear complications of scarlet fever are a common cause of deafness.

Infectiousness of Scarlet Fever. While highly infectious, it is indeed fortunate that scarlet fever does not show the very ready communicability of measles or whooping cough. Rather intimate contact with the sick seems to be required to transmit the disease. Observations have been made which allow us to estimate roughly the frequency with which persons, after exposure, contract the disease. These show that about 37 per cent. of children sicken with scarlet fever after exposure, while in the case of measles about 99 per cent. of those unprotected by a previous attack will take the disease under like conditions.

Period of Incubation of Scarlet Fever. While the average period of incubation of scarlet fever (i. e., the period between exposure and the appearance of symptoms) has been stated to be from two to four days, with a maximum of seven, the latest observations show that this period is very variable. The limits of the period of incubation are practically from four to twenty days, with an average of ten to fourteen days.

Portal of Entry of the Scarlet Fever Germ. All the evidence tends to show that the mouth is the usual gateway through which the germ of scarlet fever enters the body.

How Scarlet Fever Is "Caught." Each new case of scarlet fever is derived from some previous case of the disease. The scarlet fever germ is present in the discharges from the mouth, nose, and throat of the sick. The virus is also believed to be present, in the absence

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of proof to the contrary, in the flakes of skin shed during the peeling process. When there is a discharge from the ears, as a result of ear complications, this discharge also is infectious. This is true of other pus discharges, as from abscesses. The urine, too, in cases of scarlatinal nephritis, and matters vomited at the onset or during the course of the disease may contain the infecting agent of scarlet fever.

The disease is transmitted from those sick with scarlet fever to the well who come in contact with them because these discharges get on the hands or mucous membranes of such persons. The infection is caused by direct contact, as by kissing, or by being sprayed with the infected nose and throat discharges, in the act of coughing, sneezing, or talking (droplet infection), or indirectly through various objects, such as drinking cups, candy, apples, pencils, pocket handkerchiefs, towels, and the like which have been placed in the mouth or infected with the discharges of those sick with scarlet fever.

It has often been pointed out that the chief factor in the spread of such diseases as scarlet fever and diphtheria is the freedom with which the fluids of the mouth are exchanged among human beings, especially among children. But little observation is needed to convince us of the frequency, during the day, with which the hands are carried to the mouth and then handle objects in common use. This tendency is, of course, greatest among children.

Duration of the Communicability of Scarlet Fever. Scarlet fever can be transmitted from the time of onset until the mucous membranes of the nose and throat are completely healed, a period sometimes lasting many weeks. All the evidence at hand tends to attach increasing importance to the discharges from mucous membranes and less to flakes of skin, shed during desquamation, as conveyors of scarlet fever infection.

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SCARLET FEVER

It must not be forgotten, however, that peeling of the skin is caused by its previous inflammation, which is paralleled by a similar process in the mucous membranes. We may assume roughly that it will take at least as long for the mucous membranes to regain their normal condition as it does the skin. As all the available evidence shows that the infectious agent of scarlet fever continues to be thrown off until the mucous membranes are completely healed, the necessity is obvious for regarding a patient as capable of transmitting scarlet fever at least until desquamation is complete, and longer if a discharge or inflammation still persists in the nose, throat, or ears, or if an abscess be present. In general, it may be said that at least five to six weeks must elapse as a minimum before the patient can be considered free from the danger of transmitting the disease to others. This period must be extended as long as any evidence of an unhealed condition of the mucous membranes exists.

Scarlet Fever "Carriers." The spread of a number of communicable diseases is assisted by the agency of "carriers," i. e., apparently well persons who harbor in their bodies and spread the germs of a particular disease. The agency of "carriers" is important in disseminating such diseases as diphtheria, typhoid fever, cerebrospinal meningitis, cholera. While, in the absence of the knowledge of the specific germ which causes scarlet fever, there is no evidence to show that persons who have never had this disease can harbor its germs in their noses and throats, yet there is a very important class of scarlet fever "carriers."

These consist of the "missed cases," viz., those persons who have suffered from scarlatinal sore throat alone, without eruption; who have not been sick enough to go to bed or, possibly, even complain of their symptoms, and the convalescent "carrier," the child, who after an attack is allowed to mingle with his playmates too soon, or

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who continues to harbor the contagion in his nose and throat for a long time after apparent recovery. Such persons undoubtedly play an important part in spreading scarlet fever.

Milk-Borne Scarlet Fever. There are numerous records of outbreaks of scarlet fever in which the infection was conveyed by milk. These outbreaks were usually of an explosive character, and usual proportion of adults were attacked, and the disease was often severe.

In every instance the source of the infection was shown to be due to the presence of persons suffering from scarlet fever, either on the dairy farm or among the persons engaged in handling the milk.

Immunity to Subsequent Attacks of Scarlet Fever. The protection against future attacks conferred by a single attack of scarlet fever seems strong and lasting. Second and even third attacks of the disease have been observed. Relapses also are occasionally noted, i. e., a child, apparently well upon the road to recovery, sickens anew and goes through a second siege of the disease with all its attendant symptoms, including peeling.

Complication with Other Infectious Diseases. It must not be supposed that, because a person is suffering from scarlet fever he is thereby protected from having other communicable diseases at the same time. Scarlet fever has frequently been observed to be complicated with both measles and diphtheria.

Prevention of Scarlet Fever. It is plain, from what has been said, that scarlet fever is no disease to be lightly held. To infants and young children it is a very fatal affection for which we have no specific remedy. Once contracted the disease must run its course. Yet, in spite of its communicability it is by no means a disease which "every child is bound to have sooner or later." The folly of the complacent attitude which permits the exposure of children to the diseases of childhood "so that they may have them over and done with" cannot

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be too strongly condemned. If we succeed in protecting our children from scarlet fever during childhood, the chances that they will suffer from the disease later will be very greatly reduced. By so doing we will have protected them from what constitutes a very real menace to their lives, or to their subsequent physical efficiency.

The prevention of scarlet fever rests upon two foundation stones, the early recognition of the disease and the immediate isolation of the sufferer.

Diagnosis of Scarlet Fever. While the responsibility for the diagnosis of scarlet fever must rest upon the attending physician, the citizen can be of material assistance in limiting the spread of scarlet fever by being constantly alive to the possibility of outbreaks of the disease in his family. If a child be suddenly taken with vomiting and fever, or with dryness, tickling, or soreness of the throat, if soreness of the throat alone be complained of, or if any rash be discovered on the body in absence of other symptoms, no time should be lost in isolating the child and calling in a physician in order to ascertain the nature of the disorder as promptly as possible. It is the mingling of children sickening with a communicable disease with other children before its nature has been determined which helps to spread such diseases.

A great deal could be accomplished in the way of controlling the communicable diseases of childhood if it were the invariable rule in every household to isolate all children from other children as soon as they become ill until the nature of the sickness has been made out, especially when such illness is accompanied by sore throat, running nose, or huskiness of the voice.

The Care of Scarlet Fever in the Home. The important principle to remember, in the care of scarlet fever, is that a child sick with scarlet fever who is carefully isolated does not transmit the disease.

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SCARLET FEVER

The Sick Room. The first rule, therefore, in the care of scarlet fever is to place the patient at once in a separate room. This room, if possible, should be on the story of the house the least in use, its adaptability for sick room purposes being considered. All hangings, carpets, and upholstered furniture are to be taken from the room before the patient is brought in. The furniture left should be reduced to strict necessity and be of a kind readily cleansed.

There should be no such fancied attempts at purifying the air as by hanging up sheets wet with disinfectants. Such measures are not only useless, but tend to give a false sense of security.

It is well to have a gas or kerosene stove in the room, so that water may readily be heated to boiling.

Separate Linen, Bedclothes, Etc. The patient should be provided with separate bedclothing, nightgowns, towels, eating utensils, and drinking vessels for his exclusive use. These should be kept rigidly separate from those used by the rest of the family. After use they are to be soaked for an hour or two in one of the disinfectant solutions given below, and then boiled for one-half hour in soapsuds. The clothes worn by the patient when taken sick should also be disinfected in the manner above described. Articles of wearing apparel which cannot be so disinfected should be burned

Attendant for the Patient. The patient should be provided with an attendant who remains with him and holds no communication with the other members of the family. This attendant should be the only person coming in contact with the patient apart from the attending physician.

Use of Disinfectants. A tub of good disinfectant solution should be provided for soaking articles used by the patient. A basin of disinfectant should also be at hand for cleansing the attendant's hands after handling the patient.

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SCARLET FEVER

The following are proper disinfectant solutions:

1. Two per cent. solution of phenol (carbolic acid).

2. Two per cent. solution of liquor cresolis compositus, U. S. P. (compound solution of cresol).

A 2 per cent. solution is made by adding 3 ounces (6 tablespoonfuls) of the disinfectant to 1 gallon of water. All surfaces soiled with discharges from scarlet fever patients should at once be flooded with the disinfectant solution.

All articles used by the patient should be soaked for one to two hours in the disinfectant solution and then boiled for one-half hour in soapsuds. Discharges from the nose and throat of the patient are to be received into pieces of cotton gauze or old, clean squares of linen, which are then immediately placed, after use, into the solution of disinfectant. They are then burned. The discharges from the bowels and kidneys should be received in a bedpan or vessel containing a solution of carbolic acid (1:50), or compound cresol-solution (1:50), and enough of the same added to cover them. They should stand in this vessel for not less than one hour and then be emptied into a water closet where there are sewers, or deposited in a trench where there are no sewers. All fragments of skin should be carefully collected and burned by the attendant. Partially eaten food is also disposed of by burning.

Care of the Patient During Peeling. During desquamation the process is facilitated by rubbing the body with some bland unguent like olive oil or cocoa butter.

Care of Attendant's Hands. It is important to remember that the hands become readily infected when caring for scarlet fever patients. Unnecessary handling of the patient, therefore, should be avoided. Whenever this is necessary the hands should be cleansed in disinfectant solution, and then in hot soapsuds.

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SCARLET FEVER

Other Precautions for the Attendant. A loose gown or wrapper and a head covering should be provided for the protection of the attendant's hair and clothing. These coverings should always be regarded as infected, and not sent out of the room until they have been soaked in disinfectant for an hour. They should then be boiled. The attendant should wear dresses of material not injured by disinfectants, as these should also be disinfected. On going out for fresh air and the like the attendant's garments should be completely changed. Gowns and head coverings should also be provided for the attending physician. These are kept outside the room. Immediately after use they are soaked in disinfectant for an hour and then boiled for one-half hour in soapsuds.

It is advisable that the attendant use an antiseptic mouth wash regularly. A good wash for this purpose is made by mixing 1 ounce of hydrogen peroxid in a glass of water and adding 10 or 15 drops of a 10 per cent. alcoholic solution of thymol.

Ventilating and Cleansing the Room. There is little tendency to "catch cold" in scarlet fever. The bedclothes should be light and the room aired thoroughly several times a day.

A room temperature of about 65° is suitable. No sweeping should be done, but the floor and furniture are to be frequently wiped with cloths dampened in disinfectant solution. After use the cloths should be soaked in disinfectant solution.

Screening Against Flies. When flies are prevalent they should be kept away from the patient by the careful screening of all openings. Any flies which gain access to the sick room should be killed.

Bath After Recovering. After recovering, the patient's entire body, including the hair, should be bathed in warm soapsuds. The patient should then be removed from the room and dressed in clean clothes which have not been in the room during sickness.

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SCARLET FEVER

Subsequent Cleansing and Disinfection of the Sick Room. The cleansing and disinfection of the sick room after recovery from scarlet fever will, in cities, be governed by the regulations of the local health office; but cleansing and airing of the sick room should always be done. When the householder must follow his own initiative in the matter, the following measures may be carried out:

The room can be disinfected by formaldehyde gas in the following way:

Disinfection by Formaldehyde Gas. All cracks in the windows, register, and stovepipe openings, and the like are to be closed by pasting strips of paper over them with starch paste. Everything in the room may be left in situ, but closets, drawers, and trunks are to be left open. The gas is generated by pouring formalin (40 per cent. solution of formaldehyde gas in water) on permanganate of potash in 10-quart galvanized pails. The amount to be used depends upon circumstances, 10 ounces of formalin to 5 ounces of permanganate being a suitable allowance to each 1,000 cubic feet of air space, when the air is warm and moist, and double this quantity if it be cold and dry. In any event, no more than 10 ounces of the formalin and 5 ounces of the permanganate should be placed in a single 10-quart pail, as the evolution of the gas is very vigorous and attended with considerable sputtering. Each pail should be placed in a large tin pan in order to prevent damage from sputtering, and the pails evenly distributed over the room, allowing one or two pails to each 1,000 cubic feet, according to the atmospheric conditions.

Five ounces of the permanganate of potash are placed in each pail, and for each pail 10 ounces of the formalin is measured out in wide-mouthed vessels or cups and placed beside the pail in which it is to be used. Narrow-necked bottles should not be used, as the pouring will take too much time.

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When everything is ready, start the generation of the gas by pouring the formalin on the permanganate of potash in each pail, proceeding as rapidly as possible and beginning with the pail farthest from the exit. The door is then rapidly closed and the keyhole and door cracks are pasted up with paper and starch paste, which should be in readiness outside the door.

The room should be kept closed for four hours. At the end of this time the doors and windows are opened and the gas is allowed to blow out. After the gaseous disinfection is completed, bed linen, garments, towels, and the like are disinfected in the manner previously described. The floors are flooded and scrubbed with hot disinfectant, the furniture is washed, and the walls are washed with the same as high as can be reached. Mattresses may be disinfected by steam; otherwise they should be burned. Books, toys, and similar objects used by the patient should be burned. The walls of the room should then be whitewashed or repapered, as the case may be.

In rural districts there may be some difficulty in getting the necessary chemicals for the above method of disinfection. In such cases the disinfection may be done by means of sulphur gas generated by burning sulphur in pots, according to the following method:

Pot Method for Disinfection by Sulphur Gas. The materials needed for this method of disinfection are pots, sulphur, and a little alcohol.

For burning the sulphur a broad, shallow receptacle with a flat bottom twelve to fifteen inches diameter and about four inches high is best. A dish pan answers the purpose very well.

Allow 5 pounds of sulphur to each 1,000 cubic feet of air space in the room.

After sealing all cracks with paper strips and paste in the manner previously described, begin by weighing out the amount of sulphur required by the cubic feet of air space of the room.

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SCARLET FEVER

A sufficient number of pans should be available, so that the sulphur will form a layer in the bottom not over one and one-half to two inches deep. A crater-like depression is made in the center of the sulphur extending outward. If stick is used, it should be broken up and a portion pulverized.

Each sulphur pot should stand in a pan containing an inch or two of water, as the pot gets very hot. In addition to the protection from fire which this precaution gives, the heat from the pots evaporates the water and adds to the efficiency of the disinfection. If no pans for water are available the pots may stand upon earthen or metal surfaces and the disinfection will still be efficient if the air is sufficiently damp.

When everything is in readiness, start the disinfection by sprinkling the sulphur in each pot with alcohol. The alcohol in the pots should then be lighted. A convenient and safe method for doing this consists in striking a match and dropping it into the pot while the head is still burning. After the alcohol sets fire to the sulphur this will burn out of itself.

After lighting, the sulphur fumes do not begin to come off for several minutes, so the operator has an opportunity to see if all the pots are burning. As soon as all are seen to be properly lighted, the door of exit is closed and all its cracks are pasted up.

After the sulphur has been burning for half an hour a search should be made for cracks which have been overlooked. Such cracks are sealed.

The room should remain closed for twelve hours, after which the doors and windows may be opened, allowing the fumes to blow out. It is well to arrange the windows so that they may be opened from the outside, by using a ladder, otherwise it may be impossible to enter the room on account of the fumes. It should be borne in

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mind that sulphur fumes attack metals and are injurious to colored fabrics, furnishings, and the like, because of their bleaching properties. Hence the preference for formaldehyde gas for house disinfection, as the latter has no such injurious action.

Treatment of Children Who Have Been Exposed to Infection. When a case of scarlet fever occurs in a family, the other children have undoubtedly been exposed to infection. As has been previously stated, there is a good chance, though exposed, of their escaping the disease, especially if isolation of the sick has been prompt and thorough. It is therefore advisable to send such children away at once to friends or relatives not having small children of their own, taking the precaution to change their clothing completely before leaving. While there they should be carefully observed for symptoms of commencing scarlet fever for at least ten or twelve days. If they are school children, they should be kept away from school. The adult members of the family, however, who are not sick, may come and go, provided the house is so arranged that they do not come in contact with the patient. They should wash the hands and face carefully before leaving the house.

Reporting the Case. An important step in the control of any communicable disease lies in the knowledge of its prevalence by the sanitary authorities. It is the public duty, therefore, of all citizens to report cases of scarlet fever to the local health officers and to have houses placarded where such cases exist.

It is likewise the householder's duty to observe scrupulously all regulations made by local health authorities in regard to the quarantine of scarlet fever cases.

Other Precautions to Be Observed. As scarlet fever is capable of transmission through milk, it is important that all milk bottles used in houses where scarlet fever exists should be thoroughly disinfected

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by complete immersion in water, actually boiling, before being returned to the milkman. In no case should any member of the family coming in contact with the sick handle the bottles.

When a household in which there is a case of scarlet fever is engaged in any occupation having to do with the handling or distribution of food, such as the grocery business, dairying, the making of ice cream, and the like, such business should be discontinued as long as the case of scarlet fever remains on the premises, or until the patient has been removed to a contagious disease hospital, the premises thoroughly disinfected, and other members of the family observed for a sufficient length of time to assume their escape from the infection.

The Public Control of Scarlet Fever. It is evident from the foregoing that the proper care of scarlet fever in the home is no easy problem even in the most intelligent and well to do families. Thorough isolation of the sick, in the tenement districts of cities, is well nigh impossible.

Under such conditions the control of the spread of scarlet fever must be in the hands of the local sanitary authorities. The most important equipments to this end are: First, adequate contagious disease hospitals to which those suffering from scarlet fever may be removed, when it is clear, from an inspection of the premises, that cases of scarlet fever can not remain at home without danger of spreading the disease; second, an efficient corps of inspectors and nurses for the visiting and sanitary control of the cases of scarlet fever reported; and, third, an adequate system for the medical supervision of school children, so that cases of scarlet fever shall be early detected and the proper precautions taken before the infection has had a chance to spread among the scholars. Teachers also can aid greatly in the control of scarlet fever by being familiar with the symptoms attending its onset, encouraging their pupils to let them know whenever

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they feel sick, removing at once from the classroom any child having sore throat or seized with sudden vomiting, and reporting their action at once to the proper authorities. The school nurse and the school physician are indispensable agents in limiting the spread of scarlet fever in schools.

School authorities will materially contribute their share by abolishing the common drinking cup, the common towel, the common lead pencil, which, though slowly vanishing, are still too frequently encountered in our schools.

In case of death from scarlet fever, public funerals should not be allowed, because when many persons gather in and about a house in which disease has occurred there is great danger that some one may catch it. The danger is not from the dead body, if properly prepared, but from contaminated articles that may be about, and especially from members of the afflicted household, some of whom may be carrying the germs in the throat and nose, and may even be on the verge of coming down with the disease.

General Precautions Against Scarlet Fever. The body presents a natural resistance to contracting communicable diseases. We do not catch these diseases unless either the dose of the infecting germ has been sufficient or the natural resistance of the body has been temporarily reduced. Hence everything which tends to increase this resistance is of service in preventing a child from contracting scarlet fever. Attention to personal hygiene, the maintenance of a robust state of health by the use of suitable food, exercise, and fresh air, form serviceable general precautions for reducing the susceptibility to any communicable disease.

Attention has already been called to the mouth, nose, throat as gateways of infection in scarlet fever. Certain diseased conditions of these regions of the body, such as defective teeth, enlarged tonsils,

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and adenoids, undoubtedly make them more vulnerable as gateways of infection. Care should be taken, therefore, early to correct such faulty mouth, nose, and throat conditions in children, for by so doing, not only do we strengthen a weak part of the body defenses, but we effect thereby a notable improvement in the general health, besides removing conditions known to exert an unfortunate influence upon the subsequent physical or even the mental development.

While it is realized that it is instinctive for the child habitually to carry all objects to the mouth, it is well worth while, on the part of parents and guardians, to teach children, as early as possible, that the only substances which naturally belong in the mouth are food and drink. The danger of such practices as putting lead pencils, coins, and similar objects in the mouth, the use of the common towel and drinking cup, taking bites of the same apple or stick of candy, the failure to turn the head away when coughing or sneezing, and, in a word, all acts which lead to an exchange of the mouth fluids between human beings should be regarded as one of the earliest and most practical essentials of the education of children.

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SERUMS — VACCINES

Practical Continuous Manual. U. S. Research Bureau, Foreign and Commercial Research Bureaus Technic.

ANTIPNEUMOCOCCIC SERUM

It has been shown that pneumococci may be divided into several groups; in the case of one of these, Group I, the antiserum prepared by the immunization of horses appears to have therapeutic value. This Group I antiserum is manufactured by several commercial firms and by at least three institutions not engaged in selling the serum.

Serological tests, particularly agglutination tests, have been used to some extent in estimating the potency of the serum, but they are regarded as not trustworthy, and the only test which need be considered is that which is based on the power of the serum to protect mice against amounts of a virulent culture many times as large as that required to kill control mice. Irregularity of results is often encountered in carrying out this test. This need not occasion surprise, as we depend on the use of a living micro-organism the virulence of which varies with different cultures of the same strain with the same culture at different periods of growth or storage, and with other circumstances. Thus, it sometimes happens that a mouse receiving one dose of the culture will perish, while mice given an amount twice or even ten times as large survive. This may occur in the control series of mice receiving the culture alone, or in a series protected by any of the serums tested. In other words, there is a very large factor of error inherent in the test itself; with only one mouse inoculated for each dose this error may be so large as to nullify the value of the test. It was found that such variations of the test as simultaneous or separate injection of serum and culture, the addition of a preservative to the culture, and excessive virulence of the micro-organism, did not make any material difference in the results.

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Serums claiming to be potent against Groups I, II, and III pneumococci are tested at the Hygienic Laboratory for protection against Type I only, since there is not at present acceptable evidence of the therapeutic value of serums directed against infections with the other types of pneumococcus. Manufacturers of serums directed against Groups II and III employ appropriate protection tests for these groups.

Under this method of control, among 142 serums examined, sixteen (11 per cent.) have been rejected as below the potency considered desirable for a product for therapeutic use. The 126 other specimens have shown a degree of protection equivalent to, or higher than, a preparation made by a noncommercial laboratory which was reported to have given good results in its clinical applications.

Antimeningococcic Serum

Various students of the meningococcus have divided the cultures of the organism isolated from the spinal fluid in cases of epidemic cerebrospinal meningitis into two, three, or four groups. We have not sufficient data to accept any of these groupings as final—indeed this subject is under very active investigation at the present time—but tentatively it seemed wise to accept for testing purposes a classification which recognizes four groups. The commercial serums are tested against one or more representatives of the four groups and are not passed for use unless there is definite evidence of antibodies against the four groups of meningococci and in a reasonably high titer for at least three of these groups.

There is no agreement as to a method of testing antimeningococcic serum which will give a result that may be regarded as a trustworthy guide to the probable therapeutic efficiency of the serum. At least four methods have been proposed for estimating the usefulness

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of this preparation in the treatment of meningitis, but no one of these has been proved to be superior to the others. The methods that have been employed are: Determination of the bacteriotropin content, of the agglutinin titer, of the complement fixation titer, and of the protection of animals from the effects of a virulent culture or the toxic products of such a culture. Two of these tests at present command the support of the majority of workers on the subject: That which determines the agglutinating titer of the serum, and that which determines the complement fixation titer. Unless these tests are most carefully performed and adequately controlled, misleading results are likely to be obtained. Materials (antigens) for use in these tests, and instructions as to the details of performing the titrations, are supplied by the Hygienic Laboratory.

It has been found that among 161 commercial samples submitted, thirty-nine (24 per cent.) have failed to show a sufficiently high agglutinating titer or complement-fixing titer to justify passing the preparations for human use. As the serums are tested after having passed the manufacturers' tests, such a control as is being exercised is considered to be amply justified.

Summary

It is thus seen that these special methods of control over antipneumococcic serum are used because the test for potency, though apparently a measure of its therapeutic value, is inaccurate, involving a large factor of error. Special methods of control over antimeningococcic serum are also used because of the difficulty in duplicating a given test in different laboratories and because of a lack of agreement as to the test which is most satisfactory.

Work now in progress is expected to result in the adoption of test serums which manufacturers may use for comparative testing.

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SERUMS—VACCINES

It seems unlikely that the same exactness that obtains in testing diphtheria antitoxin or tetanus antitoxin will be accomplished with antipneumococcic or antimeningococcic serum; but the user may be assured that either of these preparations, on leaving the manufacturing establishment, is of as high a degree of potency as it is practicable to attain. The regulations of the Treasury Department prohibit the dating of these serums beyond six months after manufacture or after removal from the manufacturer's cold storage. Hence there should be no marked deterioration of the preparation while on the market.

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THE SCHICK REACTION

"The Schick reaction is a convenient and reliable clinical test by which the antitoxic immunity of an individual to diphtheria can be determined. A fresh solution of diphtheria toxin is prepared for this purpose of such strength that 0.1 c. c. or 0.2 c. c. represents 1/50 of the minimum lethal dose of toxin for a 250-gram guinea pig. This amount is injected with a good syringe, preferably a 1 c. c. 'Record' and a fine steel or platinum-iridium needle intracutaneously on the flexor surface of the forearm or arm. A good guide for the insertion of the needle into the proper layer of the skin is to be able to see the oval opening of the needle through the superficial layers of the epidermis. A properly made injection is recognized by a distinct wheal-like elevation, which shows the prominent openings of the hair follicles. The result of the test should be read at the end of 24, 48, 72, and 96 hours.

"The reaction that appears at the site of injection may be either positive, negative, pseudo, or combined positive and pseudo.

"The positive reaction represents the action of an irritant toxin upon tissue cells that are not protected by antitoxin. It indicates, therefore, an absence of immunity to diphtheria. A trace of redness appears slowly at the site of injection in from 12 to 24 hours, and usually a distinct reaction in the course of 24 to 48 hours. The reaction reaches its height on the third or fourth day, and gradually disappears, leaving a definitely circumscribed scaling area of brownish pigmentation, which persists for 3 to 6 weeks. At its height the positive reaction consists of a circumscribed area of redness and slight infiltration, which measures from 1 to 2 cm. in diameter. The degree of redness and infiltration varies to a great extent with the relative susceptibility of the individual. The positive reaction is seen in about 7 to 10 per cent. of the new-born, 30 per cent. during

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THE SCHICK REACTION

the first year of life, 35 decreasing to 15 per cent. between 2 and 14 years, and 10 per cent. of adults.

"In the negative reaction the skin at the site of injection remains normal. The negative reaction definitely indicates an immunity to diphtheria if the test-toxin is of full strength, has been freshly diluted, and the injection has been made into the proper layer of the skin. A negative reaction obtained in a child that has reached the age of 8 years indicates that it has an immunity which is probably permanent. Of 1,000 carefully observed individuals, not one developed clinical diphtheria, even though they were exposed to the disease, and some were carriers of virulent diphtheria bacilli.

"The pseudo-reaction represents a local anaphylactic response of the tissue cells to the protein substance of the autolyzed diphtheria bacilli, which is present in the toxic broth used for the test. Like other anaphylactic skin phenomena, the reaction is of an urticarial nature, appears early, within 6 to 18 hours, reaches its height in 36 to 48 hours, and disappears on the third or fourth day, leaving a poorly defined small area of brownish pigmentation and generally no scaling. At its height the pseudo-reaction shows varying degrees of infiltration, and appears as a small central area of dusky redness with a second areola, which gradually shades off into the surrounding skin. The reaction may also have a rather uniform red appearance, and be two or three times the size of true reaction. A control test, made by injecting toxin heated to 75° C. for 5 minutes, gives a similar reaction which passes through the same clinical course. Individuals who give a pseudo-reaction only have antitoxin and are immune to diphtheria. The false reaction is seen in relatively few of the older children, but in a much larger number of adults, in whom it is of importance to recognize and control it both by the injection of heated toxin and by observing the clinical course of the reaction.

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THE SCHICK REACTION

"The combined reaction represents the positive and the pseudo-reaction in the same individual. The central area of redness is larger and better defined, the amount of infiltration is also more marked. The reaction is recognized by noting the evidence of a true reaction, a definitive area of scaling brownish pigmentation, after the pseudo-element has disappeared in the test. In addition, a similar though weaker reaction is obtained in a control test made with heated toxin. The control represents only the pseudo-reaction. The combined reaction indicates an absence of immunity to diphtheria.

"The Schick test is of practical value in determining the immunity to diphtheria of the public in general, but especially of the child population in schools, hospitals, institutions, and in homes during an outbreak of diphtheria. It will save a considerable amount of antitoxin and avoid unnecessary sensitization of more than 65 per cent. of the exposed individuals. The test is also of distinct value in the active immunization of susceptible individuals against diphtheria with mixtures of toxin-antitoxin, and in the diagnosis of clinically doubtful cases of diphtheria."

As supplied by most manufacturers, the Schick test outfit consists of a tube of diphtheria toxin and a vial containing a measured amount of sterile salt solution. By mixing the contents of the capillary tube with the saline a solution is obtained which is ready to be injected into the skin.

The following is the text of directions given by a manufacturer for the use of the Schick test outfit:

"Break off one end of the capillary tube, push the broken end carefully through the neck of the rubber bulb until it punctures the diaphragm within and enters the cavity of the bulb; then break off the other end of the tube. Hold the bulb between thumb and middle finger, place the index finger over the opening in the larger end of

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the bulb and expel the toxin into the 10 c. c. of saline. Rinse out the capillary tube by drawing up saline several times, then cork the bottle and shake the diluted toxin. Inject 0.1 c. c. or 0.2 c. c., representing 1/50 M. L. D. for the guinea pig, intracutaneously on the flexor surface of the forearm or arm. The contents of the bottle are sufficient for about 35 tests. On account of the fairly rapid deterioration, it is not advisable to use the diluted toxin after 12 to 24 hours. The outfit must be kept very cold to prevent deterioration.

"A uniform technic in the intracutaneous injection is essential in the Schick test. A good guide for the insertion of the needle into the proper layer of the epidermis is to be able to see the oval opening of the needle through the superficial layers of cells. A definite wheal-like elevation, with the distinct markings of the openings of the hair follicles, shows that the injection has been made properly and that the fluid is confined to a small area of the epidermis. Here it will exert its irritant action, if the individual tested is not immune to diphtheria.

"Syringes and needles: Preferably a 1 c. c. 'Record' tuberculin syringe and a fine platinum-iridium or steel needle. An ordinary hypodermic syringe with a fine steel needle may be used in emergencies."

Active Immunization

After discovering susceptible individuals by means of the Schick test, the question at once arises as to the best method of immunizing these individuals. The protection afforded by injections of diphtheria antitoxin is of very short duration, three or four weeks being the usual period. Far more lasting is the protection afforded by active immunization. During the past three years, Park and his coworkers have employed active immunization with toxin-antitoxin mixtures in the case of over 4,000 susceptibles (including 1,000 infants under one

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week old), without the subsequent occurrence of a single case of diphtheria. Park summarizes his observations as to the value of this active immunization as follows:

The procedure is absolutely harmless. No reaction develops in infants, while in older children and adults a moderate swelling of the arm may appear and last for from one to three days.

One injection gives immunity to 80 per cent. of those previously susceptible; two injections give immunity to 90 per cent.; and three injections to 97 per cent.

The immunity conferred lasts for at least three years and probably much longer.

No diphtheria has occurred in those so far immunized.

In order to facilitate active immunization by practicing physicians, several establishments making biological products put up small vials containing a mixture of diphtheria toxin-antitoxin. This mixture is used undiluted. The dose is 1 c. c. injected subcutaneously in the arm at the insertion of the deltoid. The injection is repeated at weekly intervals until three injections have been given. For children under 1 year of age the dose is 0.5 c. c. In the younger children the local and constitutional symptoms following the injections of toxin-antitoxin are much less marked than in older children and adults. The difference is due to a greater susceptibility of the older children to the diphtheria bacillus protein, which is present in the mixture of toxin-antitoxin.

Determining the Effect of Active Immunization

The development of an active immunity is determined at the end of three months by means of the Schick test. It has been found that the development of antitoxin in many individuals is often a slow process requiring from 8 to 12 weeks before a sufficient amount

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is produced to inhibit the Schick reaction. The number of successfully immunized individuals who will show a negative Schick retest after three injections of toxin-antitoxin will be, in different groups, from 90 to 99 per cent.

INDICATIONS FOR ACTIVE IMMUNIZATION WITH TOXIN-ANTITOXIN

The use of toxin-antitoxin for active immunization may be considered under two heads.

1. As a general prophylactic measure.—The most suitable age period for testing and immunizing is between 6 months and 2 years. At this time of life the percentage of positive Schick reactions is largest and the susceptibility to diphtheria as well as the mortality from the disease is greatest. Children of this age period can be reached in the homes, in infant asylums, in the milk stations, and day nurseries. The children of the next age period are included in the preschool groups. These children can be reached in the public schools, in orphan asylums, and in the various other institutions. Among adults, those who come in contact with diphtheria and are constantly exposed and in danger should also be tested and immunized with toxin-antitoxin if found to give a positive Schick reaction. Included in this group are especially physicians, nurses, and hospital attendants in contagious-disease hospitals.

2. To control an outbreak of diphtheria.—As the immunity arising from an injection of toxin-antitoxin does not develop until the lapse of from 2 to 12 weeks, active immunization can not be utilized to protect persons from exposure within that period. In institutions, however, where small outbreaks of diphtheria have occurred, or where diphtheria is more or less constantly present and clinical cases and bacillus carriers steadily appear, the use of antitoxin alone has often been insufficient to stamp out the disease, but the combined applica-

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tion of the Schick test and active immunization with toxin-antitoxin has given successful and encouraging results. Toxin-antitoxin immunization should not be used with antitoxin immunization in the same individual, as the surplus antitoxin tends to prevent the development of an active immunity.

(To be continued in Number 2.)

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Med.

SKIN DISEASES

Treatment of Skin Diseases by Injections of Oil of Turpentine. (Zur Behandlung der Hautkrankheiten mit Terpentinölinjektionen.) Dr. J. Sellei. Dermat. Wochenschr., Leipzig, No. 12, 189.

Dr. Sellei has treated many cases of skin disease, especially impetigo and pyodermatic conditions (ecthyma, furunculosis) by subcutaneous injections of oil of turpentine. This method of treatment was also successful in superficial trichophytosis of the face, in pruriginous diseases and in pruritus caused by various conditions. The painfulness of the injections can be avoided if they are made in the posterior axillary line, 1½ inches below the crest of the ilium. The author adds that in staphylococcus infections of the skin the germs are weakened in their virulence and a speedy cure follows.

Med.

SLEEPING SICKNESS

Lethargic Encephalitis. Diagnosis. (Classification and Laboratory Findings.) Abstract by Allen H. Bunce, M. D.

In a recent article (J. A. M. A., 74: 865) Flexner calls attention to MacNalty's classification of lethargic encephalitis since it is suggestive and may prove useful in practice. MacNalty distinguishes six groups of cases: (1) cases with general symptoms and without localizing signs; (2) cases with third nerve paralysis and general disturbance in the function of the central nervous system; (3) cases with facial paralysis and general disturbance in the function of the central nervous system; (4) cases with spinal manifestations and general disturbance in the function of the central nervous system; (5) cases with polyneuritic manifestations and general disturbance in the function of the central nervous system; (6) cases with mild or transient manifestations (so-called "abortive" cases). To these Flexner adds cases of paralysis of other motor cranial nerves than the third and fifth, such as those of deglutition and respiration.

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SLEEPING SICKNESS

The initial symptoms are described as chills, lassitude and general malaise, headache and general pains, nausea and anorexia, associated often with the common symptoms of upper respiratory catarrhal affections. Fever is an irregular manifestation. It may be present at onset or may appear only later. As the symptoms develop there arise lethargy or drowsiness, vertigo, tinnitus, muscular weakness, blurred or misty vision, diplopia, photophobia, tremors and twitchings, ataxia, delirium, irritability, restlessness, mental depression and other alterations, difficulty in articulation and swallowing, stiffness of neck and spasticity of other muscles, sweating, hiccough, etc.

Among the earliest symptoms to arrest the attention of the patient and the physician are diplopia and ptosis with varying degrees of lethargy. But still other paralyses (e. g.; facial) may appear, and the lethargy may arise independently of all localizing nervous symptoms.

The outstanding feature of the disease is the lethargy, which is progressive in character and present in the great majority of cases (80 per cent.?). It may appear suddenly, but usually is gradual in onset. The patient becomes apathetic and dull, appears dazed or stupid, the hours of sleep become prolonged, and he is hard to wake in the morning. Moreover, he may fall asleep at all hours—while engaged at work or at meal-time. The lethargy may deepen into stupor or even into coma. Its duration is variable. During the lethargy, there may be lack of facial expression (masklike features). The usual state is one suggesting profound sleep, from which the patient can be aroused by loud speaking, prodding, etc., to partake of food or answer questions. But cases in which marked restlessness and even mania have been present followed by lethargy have been noted.

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Symptoms referrable to irritation of the meninges appear. Usually they are slight, and while sometimes arousing suspicion of acute meningitis, that condition is excluded by lumbar puncture and examination of the cerebrospinal fluid. The fluid tends to be under slight pressure, but clear. The number of cells is slightly increased (very rarely 100 per cu. mm.), and the globulin content little and sometimes not at all excessive. The cells, which range usually around 10 to 20 per cu. mm., consist partly of mononuclear and partly of polymorphonuclear leukocytes. In addition the important point of the rare presence of Kernig's sign should be mentioned.

Other laboratory findings in my (Bunce's) experience with several cases have been as follows: Repeated blood cultures on three cases were negative. Absolute and differential leukocyte counts have shown nothing noteworthy or characteristic. The cells in the cerebrospinal fluid taken at different times during the course of the disease from twelve cases have varied from 7 to 134 per cu. mm. The globulins have varied from normal to a very great increase as shown by the Noguchi, Pandy and Ross-Jones test. The Wassermann test on the fluid has been uniformly negative. Smears and cultures on thirty-four specimens of cerebrospinal fluid from these twelve cases have all been negative of bacteria. The urinary findings have varied. Usually early in the disease the urine is normal. Later a trace or larger amounts of albumen may be present. A marked acetonuria was present in three cases. Others have shown traces of acetone from time to time. Hyaline and granular casts have been present in several of the specimens.

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Med.

SLEEPING SICKNESS

(Encephalitis Lethargica) Differential Diagnosis and Nature of the Virus. Caducci La Riforma Medica. Naples.

Economo was one of the first authors that described Lethargic Encephalitis. The malady was also studied by Reinhart, by Siemerling, by Naef, by Rocankewski and among the symptoms noted by the above observers, is the typical somnolence (76 per cent. of the cases), paralysis of the motor oculi muscles, excluding ptosis (65 per cent.), cephalalgia and fever (57 per cent.); following in the order of frequency, are the paralysis of the ocular muscles (rectus internus and externus), ptosis, muscular rigidity of the extremities, diplopia, and symptoms arising from the pyramidal columns.

The malady attacks men and women with equal frequency and at all ages. The mortality is 34 per cent.

The symptoms as described by the preceding authors agree with those reported by Groebbel (Muenchner Medizinische Wochenschrift).

Acute non-purulent encephalitis occurs in several forms.

1st. The acute hemorrhagic polioencephalitis superior (Wernicke).

2nd. The acute encephalitis of childhood (infantile hemiplegia spastica of Strümpell).

3rd. The encephalitis hemorrhagica of adults. (Strümpell, Leichtenstern) and the encephalitis following acute infective maladies, among which is the encephalitis of influenza (Strümpell, Oppenheim, Cassirer).

4th. Encephalitis without anatomical changes.

Clinically all of these forms of encephalitis display nervous symptoms similar to those observed in encephalitis lethargica.

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SLEEPING SICKNESS

Regarding the etiology the hypothesis has been advanced that the virus of encephalitis lethargica may be identical with, or closely related to that of influenza. (Reinhart.)

From the clinical viewpoint we have in the affection of the central nervous system, observed in the preceding epidemic, a clinical picture analogous to that of encephalitis lethargica; however, in the cases reported in the epidemic of 1889-90 described by Leichtenstern, Ebstein, Tranjen, Muller, Braun, Klebs, the etiology was variously interpreted and the bacteriological investigations negative.

A second hypothesis is that the causative agent of encephalitis lethargicia may be similar or analogous to that of poliomyelitis. Strümpell maintains analogy between the acute encephalitis of childhood and poliomyelitis and gives to that form the name of acute polioencephalitis.

Regarding the first view:

Economo has maintained that there is affinity between the polioencephalitis and encephalitis of childhood as regards the pathological anatomy of the two maladies.

From the clinical side also, there is similarity, according to observations of Groebbell it is noteworthy that encephalitis lethargica presents symptoms which are also observed in the early stages of polioencephalitis, such as angina, tendency to perspire, increased salivary secretion and weak plantar reflex.

Marburg has treated the question from the pathological side. He places in the poliomyelitis group only infantile cerebral paralysis and the form of Strümpell-Leichtenstern, excluding the polioencephalitis of Wernicke and the encephalitis lethargica.

From the experimental researches of Economo and Wiesner it appears that unlike poliomyelitis, encephalitis lethargica is caused by a virus rather than by a toxin.

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SLEEPING SICKNESS

Nosography and Differential Diagnosis

According to G. Betti (L'Ospidale maggiore), there is a long prodromic period (15 days) of general malaise, vague and scattered pains, rapid loss of strength and prostration, fever, cephalalgia, somnolence; to these phenomena are added after a short time the characteristic ocular disturbances; that is: grave insufficiency of the levator palpebrae superioris, bi-lateral insufficiency of internal recti, dilatation of the right pupil with irregular contour and with accentuated reaction to light, hypotony (slight) of the right facialis inferioris, abdominal reflex imperceptible, knee and ankle reflexes normal.

From among the diseases presenting symptoms similar to those described, either cerebro-spinal or tubercular meningitis may be excluded by the presence of normal cerebro-spinal liquid, the meningeal syphilide by the presence of fever, by the absence of lymphocytosis in the spinal fluid, by the special character of the chronic cephalalgia of the syphilide.

The intoxication of the bacillus botulinus of Ermingen may be excluded by the presence of fever and the absence of any of the characteristic symptoms of the latter.

Tumor, abscess and cerebral hemorrhage must also be excluded. Aside from the characteristic symptoms—fever hypersomnia, lesions of the ocular muscles, there are according to some observers a great number of other manifestations, extremely variable in location, duration and intensity.

The nerves of the mesencephalon may show lesions and the paralysis or paresis may extend to the muscles supplied by the facialis, to the velum palati, tongue, larynx and pharynx.

There may be paralysis of the extremities, with or without contracture, convulsions, incoördination of movement, great variability in the action of the reflexes.

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THE MEDICAL INTERPRETER

SLEEPING SICKNESS

There Are No Blood Changes Worthy of Note

The hypothesis that this malady represents a symptomatic variety of influenzal infection is worthy of serious consideration.

At a recent session of the Societa Medica of the Hospital of Paris, Sicard and Kudelsky reported two cases of epidemic encephalitis of the myoclonic type.

The syndrome is characterized principally by the pain and the myoclonic succession. In one of the cases the tic was confined to the face and upper extremities; in the second the spasmodic action was manifested principally in the abdominal diaphragm. Both cases resulted in a cure in a few days.

These syndromes are distinguished from those of lethargic encephalitis by the absence of narcolepsy and the ocular disturbances.

Dufour observed three cases, recently, of hiccough with the febrile state, similar to those reported by Sicard.

A case of Carnot is worthy of mention; in this case there was myoclonia, associated with delirium which proved fatal.

In a case of Netter the lethargic condition was followed by myoclonia. He regarded both as due to the same etiological cause; this case also showed paralysis of the upper extremities.

Oettinger reports a case of the dynamico-ataxic type analogous to the preceding: the cephalo-rechidian liquid showed strong lymphocitosis and hyper-albumenosity.

The somnolence was typical but of short duration, followed by amelioration of the symptoms. These are cases of narcoleptic encephalitis. The depression and flagging of the energy was very marked. Recovery after a few days.

At a recent meeting of the Academy of Medicine of Paris, Achard stated that the lesions of the cranial nerves are not constant

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SLEEPING SICKNESS

in encephalitis lethargica and that the presence of the meningeal reaction should not preclude its diagnosis.

The anatomical changes are slight, comparatively speaking, round cell infiltration about the small vessels, and minute hemorrhagic spots in the pons and fourth ventricle.

Nothing has been revealed by bacteriological investigation yet. So the treatment must of necessity be symptomatic. The patient should not be disturbed oftener than is necessary to give nourishment while in the somnolent state. When the coma is very profound it may be necessary to introduce food by use of the stomach tube.

Dr. E. Fernandez Santz in El Siglo Medico-Madrid recommends lumbar puncture in both the diffuse and focal type, especially the former; also the administration of urotropin, 4 to 6 gm. daily. He employs adrenalin, camphorated oil or spartein as circulatory stimulants, sedatives, the bromides, hyoscins, valerian, etc. Such analgesics as phenacetin, pyramadon and antipyrine and if indicated the hypnotics, veronal, chloral opiates, etc. If there are bulbar symptoms (dysarthria, dysphagia, irregular respiration, tachycardia, etc.), he employs injections of strychnine except in cases presenting considerable excitement.

Med.

SLEEPING SICKNESS

Lethargic Encephalitis. Nona.

There has, at different periods, for several hundred years, appeared an epidemic disease, characterized by headache, fever (in about 75 per cent. of the cases), ptosis, mystagmus, paralysis of the oculomotor muscles, paralysis of the facial nerves, muscular pains and rigidity, sometimes delirium, and the dominant symptom, somnolence.

In 1917 cases of this nature appeared in nearly all of the European countries.

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SLEEPING SICKNESS

In 1918 the disease was reported epidemic in England as well as on the continent; cases were observed in Australia, in Uruguay, in Algiers, and a large number were reported in the United States. Exact statistics as to the number of cases cannot be obtained. It is probable that many cases were overlooked and may have been diagnosed as other forms of nervous disease.

On each appearance of the disease it has been spoken of as a new disease.

In the earlier epidemics the cause was generally ascribed to some form of food poisoning, as botulism, and in the epidemic just passed, Economo was inclined, in the early stage of his first case, to attribute the sickness to the consumption of meat which had been packed in a bag. In the winter of 1919, the epidemic was general in all parts of the world.

In its symptomatology it appears to be identical with the disease known as Nona, which appeared in northern Italy, Switzerland, and Hungary in 1890.

Netter of Paris regards Lethargic Encephalitis and Nona as the same disease.

Absolute proof of the identity of the two diseases is, however, lacking, as the etiology and pathology of Nona is not sufficiently well known to make the identity certain. However, from the remarkable similarity in the clinical symptoms it would seem highly probable that Nona, the Schlafkrankheit of Germany, the mal mazucco of Italy, the sleeping sickness of the laity, and the Encephalitis of Economo are one and the same disease.

Lethargic encephalitis is evidently caused by an unidentified virus which has an affinity for the cerebro spinal nervous system and its enveloping membranes. The disease is transmissible to the horse, monkey, rabbit, and calf. The marked variability in the symptoms

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and in their different degrees of severity is doubtless due to the varied regions assailed and to the area involved in the pathological processes.

There is considerable difference of opinion as to the probable etiological relation between lethargic encephalitis and influenza; the fact that the two diseases have often and, perhaps, usually occurred concurrently would naturally suggest such a relationship. But such coincidences certainly do not furnish sufficient evidence to establish the fact; and the frequent occurrence of encephalitis lethargica in individuals who have not had influenza would make the connection between the two maladies doubtful.

As we have no definite knowledge as to the cause of either of the diseases, it would appear that the question must remain unsettled until the morbid agencies involved in their causation are fully established.

Study of the clinical symptoms makes it clear that all parts of the central nervous system including the meninges and nerve roots are liable to attack by the virus.

For instance the somnolence is likely caused by involvement of the telencephalon; the incoördination may be ascribed to the cerebellum; slow pupillary reaction to the mesencephalon; nystagmus

Von. Economo in an exhaustive article, in Il Policlinico, Rome to meningitis, etc.
(April 1, 1920), discusses the subject of lethargic encephalitis in all its varied relations.

The study of the etiology of the disease should receive the closest attention.

Thirteen cases occurring in his service are minutely described and all phases carefully reviewed and discussed.

Symptoms. The prodromic stage is usually brief (other observers have found it long).

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SLEEPING SICKNESS

During this period the patient is tired, complains of headache, pain in the back, general discomfort, and usually of fever, preceded in most of the cases by slight rigors, conjunctivitis and other catarrhal symptoms. Somnolence is usual at this time, and in some of the cases it is the first sign noted.

Together with the somnolence some of the milder meningeal symptoms appear; the latter, however, do not develop into true meningitis.

The patient falls asleep in most any posture, sitting or even standing. In the earlier stages the somnolence is not very profound and the patient can be wakened without much difficulty. He will answer questions and converse intelligently, comprehending all that is said to him; but when left to himself, he quickly falls asleep.

Objective examination reveals functional alterations in the motor muscles of the eyes, generally paralysis of the extrinsic or intrinsic motor-oculi muscles as well as of the levatores palpebrae. Nystagmus and bulbar symptoms are present in nearly all of the cases and alterations in the cranial nerves are frequent.

Speech and deglutition become difficult, coördination of motion and the sense of equilibrium are impaired, the various reflexes are disturbed. The upper extremities are paralyzed in some of the cases. Temperature does not run a typical course; some of the cases begin with fever, some develop it later, and some are afebrile throughout the entire course of the disease.

The somnolence, which except in very mild cases and excluding minor fluctuations, increases progressively, is often associated with delirium, which resembles somewhat the delirium of alcoholic cases, but differing from it by the closed eyes and lesser degree of excitement displayed by the encephalic patient.

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SLEEPING SICKNESS

In this stage the patient can still be roused but the narcolepsy becomes deeper and deeper until he finally sinks into a profound coma. Occasionally a patient will regain consciousness for a few hours, or, perhaps, for a day or two, and then relapse into the comatose state again. Death may result in a few days or the coma may continue over a considerable period.

Recovery is complete in some of the cases and others are left with paralysis.

Every case must be regarded as grave and the prognosis as doubtful. In the winter of 1916-17 a number of cases were seen in Rome and in other parts of Europe.

There was an epidemic in 1890 in Northern Italy and Switzerland the symptoms of which closely resemble those of the epidemic of lethargic encephalitis, just passed; it was known by the name of Nona. Sporadic cases of Nona were also seen in Dalmatia and in southern Hungary. The descriptions of that malady were not given with sufficient completeness by the journals of the period to make the symptomatology entirely clear; however, all of the writers recognized the epidemic character, the somnolence, the dilirium, and the serious nature of the malady, many of the cases proving fatal (Bozzelli, Longuet, Gillette de Grandemont, Uthoff, Ebstein, Tranju, Braun, Hallager).

Many of the physicians of that period regarded Nona as a sequel of the influenza which was epidemic at the time.

As early as 1848 Graves described a sequel of influenza, characterized by somnolence, delirium and coma.

In 1712 there was, according to Biermer, at Tübingen, Germany, an epidemic of what was popularly called sleeping sickness (Schlafkrankheit). Camerarius wrote regarding it in the Ephemerid. curio. natural: "Gravedo ista quondam Germanis (die Schlafkrank-

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heit) dicta fuit nunc agrypnia nunc veterno molestior. Noctes utique graves turbatae phantasiis; frequens etiam per diem querela de afflictis oculis utut non inflammatis, aegere tamen aperiendis nec lucem ferentibus."

Here then are described somnolence and delirium while in the "querela de afflictis oculis aegere aperiendis," evidently we have the ptosis observed in our epidemic.

In spite of the similarity of the symptoms it is nevertheless, impossible, at the present day, to identify positively the sleeping sickness of Tübingen or the Nona of a later period with the encephalitis lethargica of the epidemic we have just passed through. However, it is interesting to note that a malady of epidemic character and presenting symptoms of somnolence, delirium, ptosis paralysis has appeared at intervals. None of these cases, however, presented an absolute pathognonomic symptom, many of them lacked the most characteristic symptom or lasted only for a brief period. There were, however, in the epidemic just passed, light cases which pursued the same course; in some of the cases the symptoms were so mild that the patients were not even confined to the bed; such cases must be regarded as abortive.

Since 1916-17, a considerable number of cases have been observed in Italy, Spain, France, and England. The disease was epidemic in 1918. The local government board reported 105 cases in England; most of which were considered typical. Cases were also observed in New South Wales, in Uruguay, in Algiers, in Japan, and in fact in nearly every part of the world. In the United States cases were reported in most of the medical centers. It is not possible to give exact statistics as to the number.

Von Economo does not regard a depraved condition of nutrition as a directly causative element. Most of the individuals observed by

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him were well nourished when attacked by the disease, although they became emaciated during the progress of the sickness.

In his first case he suspected, at the outset, that the patient was suffering from a toxemia caused by eating packed meat a day or two before; but the absence of intestinal involvement and the fact that the malady was assuming epidemic proportions compelled the abandonment of the hypothesis.

It was also suspected in some of the earlier cases that gas poisoning might be an etiological factor; of course that opinion was soon abandoned. Research among the micro-organisms seemed more likely to furnish the true etiological explanation.

The result of autopsies on two of Economo's cases is given here as likely to throw some light on the pathology of the disease. The autopsies and reports were made by Professor von Wiesner, and he is quoted verbatim.

Internal surface of the cranial vault somewhat rough, impressiones digitatae very pronounced, dura mater tense and lucid. Arachnoid and pia pale and nearly opaque, in the anterior part of the brain adherent to the cerebral substance, posteriorly separated by an abundant transparent serous exudate. Encephalon slightly atrophic, anemic and humid. The ependyma of the lateral ventricles rough and wrinkled. Macroscopically the pons and medulla oblongata display nothing characteristic of the disease in the transverse section.

Purulent bronchitis in the lower lobes of left lung; recent lobular pneumonia in both lobes, recent fibrinous pleuritis, pulmonary edema. Acute atrophy and fatty degeneration of the heart; fatty degeneration of the liver and of the kidneys. Acute swelling of the spleen. Decubital ulceration over both trochanters and in the sacral region. In this case there had been no abnormality in the urine and

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none in the spinal liquid except a slight increase in pressure. Wasserman negative, three tests.

In the second necropsy revealed hyperemia of the brain and the meninges, hyperemia of the zona and edema of the medulla oblongata and of the thoracic medulla. Acute pulmonary edema, serous effusion in left pleura and partial adhesion of right lung, parenchymatous degeneration of the liver, subacute tuberculosis of the kidneys, caseous and calcified tuberculosis of the iliocecal lymphatic glands. Hyperplasia of the follicles at the base of the tongue and of the tonsils. Nutritional condition fairly good.

In this case the fatal termination occurred the third day. Economo is an advocate of the opinion that there is no causative relationship between influenza and encephalitis lethargica; but that the latter begins de novo. He calls attention to the very early appearance of the somnolence, which is almost the initial symptom in most of the cases observed by him, also to the light meningeal symptoms which in no case developed into true meningitis and the acute and generally transient oculomotor paralysis, the paralysis of the extremities and above all to the principal symptom common to most all of the cases, the somnolence, which as stated above is almost the initial symptom, and moreover the dominating symptom and the one from which the disease derived its name. These facts taken together with the additional fact that the Pfeiffer bacillus has not been found in the spinal fluid of encephalitis cases should be sufficient to prove their lack of etiological relationship, regardless of the fact that both have appeared at the same time. The macroscopic and microscopic reports of four cases as well as the clinical symptoms in the same patients showed a polioencephalitis from the beginning of the sickness, and is therefore confirmatory of the above opinion. It

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is probable that some of the earlier symptoms of encephalitis lethargica may in some individuals have been mistaken for those of influenza.

Microscopically we always observe a cellular infiltration of the vascular parietes and of the nerve parenchyma, especially of the central gray matter with participation, more or less accentuated, of the cortical gray matter and of the distal parts of the bulb and spinal medulla.

There should be but little difficulty in differentiating between lethargic encephalitis and typhus which sometimes produces an encephalitis similar to the former variety; even when the temperature follows the typhus curve, as the spleen is not enlarged in encephalitis [except from pre-existing causes—Ed.] and the Widal and Diazo reactions are always negative.

Another malady which sometimes occurs epidemically and which, moreover, produces encephalitis is the poliomyelitis of Heine-Medin. The pathological report of a case showing a reddish gray discoloration of the medulla might make it appear that the case was one of the latter disease, but there had been no epidemic of poliomyelitis that year and an epidemic of poliomyelitis which presented itself in the form of an encephalitis would be at least strange.

In 1895 Nauverk demonstrated the presence of the Pfeiffer bacillus in focal encephalitis, Pfuhl also demonstrated it, and 1911 Simon found the bacillus of influenza in the spinal fluid.

The spinal fluid has been examined by a great many investigators in the lethargic encephalitis cases for the presence of the influenza bacillus so far with negative results in every case.

Since the discovery of Pfeiffer's bacillus the term "influenza," which had come to be used indifferently with that of grippe, to designate many of the rheums, should be reserved for the cases in which the Pfeiffer bacillus can be demonstrated; and the term grippe may

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properly be used to designate the forms in which the etiology is not clear.

An emulsion prepared from the substance of the brain and medulla of a patient who had died from encephalitis lethargica was injected under the dura mater of a monkey, the left temporal bone having been trephined, 0.2 c. c. of the emulsion was employed and care exercised to avoid any injury of the brain.

Immediately after the injection the monkey seemed well and ran about the cage as usual; at the end of five hours he was lying on the floor and appeared ill. After the lapse of twenty hours the animal showed signs of somnolence, when aroused to eat, his eyes were partially closed; when not disturbed he slept profoundly.

The right hind paw was paralyzed, movements were uncertain and hesitating. Forty hours after the injection he was in a state of torpor, the muscles of deglutition were paralyzed. There was no apparent rigidity of the neck but the head was thrown back. After another twelve hours the beast was in a comatose condition and two hours later he died.

Section showed a typical picture of acute hemorrhagic encephalitis of a severe type, especially diffuse in the gray matter of the cortex, in the basal ganglia, symmetrically on both sides, and in the medulla oblongata, there was also edema and hyperemia of the cortex of the medulla.

In a second experiment of the same kind the emulsion was filtered with a Berkfield filter before the injection was made; this injection showed a negative result.

These two experiments show, 1st. That encephalitis lethargica may be transmitted, as such, from a man to a monkey.

2nd. That the disease is not due to a poison or a toxin but to an active virus which cannot pass a Berkfield filter.

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SLEEPING SICKNESS

Diagnostic.—The spinal fluid sometimes shows a slight increase in pressure, usually the pressure is normal; the fluid is clear and presents little or no departure from the normal state, in some of the examinations there was a slight increase in albuminosity and light lymphocytosis. V. Economo says that a case beginning with catarrhal symptoms in the head and respiratory tract, followed after a brief prodromal stage by cephalalgia, meningitis, somnolence, oculomotor disturbances (paresis, diplopia, strabismus, ptosis, mystagmus), contractures, ataxic and choreic movements, should be diagnosed as encephalitis lethargica. This diagnosis may be regarded as certain if lumbar puncture gives a clear fluid with normal or nearly normal tension and without, or with very small, increase in the number of lymphocytes. The reflexes are variable; in some individuals the patellar reflex is quick and exaggerated and in others it will be found slow; this is also true of the abdominal and ankle reflexes. Some patients have positive Babinski, others negative.

The same applies also to the Kernig and von Graefe tests.

Muscular rigidity in the neck and arms is sometimes present and sometimes not. The nature and severity of the symptoms vary greatly in different subjects. This is doubtless due to the variations in the extent and number of the areas of the central nervous system invaded. While the disease is doubtless caused by attack of a single morbific agent against the cerebro-spinal nervous system and its meninges, the regions assailed vary in location and extent and the severity of the manifestations are, without doubt, modified by the degree of virulence possessed by the virus and by the degree of resistance displayed by the different patients.

As regards treatment Economo, in agreement with most of the European writers, recommends the administration of urotropin and in the nonfebrile cases the injection of milk. He states, however, that

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there is no certainty of shortening the course of the disease; his opinion regarding the use of anti-streptococcic injections and the injection of the patient's cerebro-spinal fluid is the same as regards the other remedies mentioned.

Bernhard advises the use of the streptococcic and pneumococcic vaccines in all cases. Simon claims brilliant results from intra-spinal injection of streptococcic vaccine.

Feeding by use of the stomach tube and per rectum must be employed when the state of stupor is so great that the patient cannot be roused sufficiently to eat. Prognosis as to life must be guarded (Economo gives the mortality percentage at 40 per cent. Nesbitt gives the rate in England as 25 per cent).

The prognosis is good as to the cure of the paralysis and the ataxic and choreic symptoms as well as of the clouded mental and psychic states. Some months are likely to be required for the cure of these conditions.

At a recent meeting of the Academy of Medicine of Paris, Broquet vigorously opposed the injection of influenzal serums in cases of encephalitis lethargica.

Duration.—The somnolent state may last only three or four days or it may extend over a period of four or five weeks. It has been known to result in recovery in a case lasting eight weeks.

In the severe type the recovery is gradual and slow, the patient begins to look about and speak but the drowsiness continues and wears off slowly, the patient speaks in a sing-song manner and his intonation is nasal. During convalescence the patient is weak and anemic and muscular movements are painful; considerable time is required to completely restore the health.

Pace, Naples (Riforma Medica), gives detailed reports of two cases of a severe character which were cured by lumbar puncture

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and the withdrawal of 30 c. c. of spinal liquid. Improvement in the symptoms began in a short time and the rigidity of the muscles, ptosis, fever, somnolence and paresis showed progressive improvement and cure resulted in both of the cases in a few days.

Other writers also have spoken favorably of the results obtained by this procedure.

At the meeting of the Académie de Medicine, Paris, held recently, M. Laubie of Danzenac (Corrèze) describes ten cases which had occurred in his immediate neighborhood since July, 1919; four of these had proved fatal. He argued the communicability of the disease both by direct and indirect contagion and mentioned facts drawn from the history of the series, which, in his opinion, substantiated his contention. At the session of the same society M. Laubie reported the rapid cure of two cases of encephalitis lethargica by intra-rachidian injection of 10 c. c. of anti-tetanus serum. In the first case the injection made on the fourth day of the sickness was followed in 36 hours by a very marked amelioration of the symptoms; the temperature fell rapidly, and the dyspnoea, ptosis, photophobia, rigidity of the neck and somnolence disappeared in two days. In the second case treated in the same manner the muscular rigidity disappeared in forty-eight hours and the Kernig at about the same time, the other symptoms also subsided promptly and patient was well in a few days.

Izar, Rome (Il Policlinico, 19 Aprile, 1920), describes eight cases all of which displayed the symptoms of encephalitis lethargica in a severe form, and in all of which he found acetone or diacetic acid or both in the urine. Prompt relief of the symptoms was obtained in all of them by employment of alkaline treatment. He gave from 15 to 30 grains of sodium bicarbonate orally and 20 per rectum.

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SLEEPING SICKNESS

The dose by mouth was repeated several times a day and the quantity of acetone and diacetic acid was very much lessened in 24 hours and disappeared in from two to seven days in every case.

With the disappearance of the acidosis the nervous symptoms also subsided in a few days and all of the patients recovered.

Med.

SLEEPING SICKNESS

London Lancet

In 1734 John Atkins described, under the term "sleeping distemper," a disease which he found to be common among the natives of the "coast of Guinea," and, although it was not until 1903 that the work of Castellani, Bruce, and others linked up the disease with a particular stinging fly and a characteristic blood parasite, the term "sleeping sickness" has been in general use for nigh on two centuries to denote this form of negro lethargy. Since 1903 "sleeping sickness" has become synonymous in medical literature with trypanosomiasis, and Castellani and Chalmers head the relevant chapter, in the recent edition of their Manual of Tropical Medicine "sleeping sicknesses." A similar nomenclature is in use the world over; we need only mention (Fr.) maladie du sommeil, (Ital.) malattia del sonno, (Ger.) Schlafkrankheit, (Port.) doenca de sômno. It would, therefore, be very inconvenient and lead to needless confusion if the same term is used for quite another malady, as there is a tendency to do in the daily press at the moment. The little epidemic of encephalitis occurring in England during the spring of 1918 was unfortunately labelled "botulism" for a while and a gamut of other terms, such as toxic ophthalmophlegia and Heine-Medin disease was employed until at the combined sections of the Royal Society of Medicine in November, 1918, it was agreed to follow von Economo in the use of the word

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SLEEPING SICKNESS

"encephalitis lethargica." It was at this discussion that Professor A. J. Hall suggested that "sleeping sickness" would not be an inappropriate name for the epidemic, and the lay press has taken his view and acted upon it. It remains for those who are concerned for an informed and accurate public opinion on health matters to devise some popular term for encephalitis lethargica less cumberous than "lethargic encephalitis" and free from the objection to "sleeping sickness." The disease is too new to appear at all in the official Nomenclature of Diseases (5th edition, 1918), which gives no help in the matter. It might be well to revive "nona," which was the term used to describe a similar outbreak of febrile illness with somnolence in Italy, Bavaria, and Russia, in the year 1890. The word has the merit of never having been used to describe anything else and of not committing the user to any theory of causation, the actual agent of the disease being still as uncertain as the derivation of the word.

Med.

SLEEPING SICKNESS

Encephalitis Lethargica.—Smith Ely Jelliffe, M. D., Ph. D., says in the *New York Medical Journal,* that the term Encephalitis Lethargica was first used by v. Economo of Vienna, 1917. Historical studies, however, show that the disease was observed as far back as Hippocrates and Homer. While several different causative factors are recognized, it is probable that influenza and poliomyelitis are the most frequent causes. English observers concerned themselves with botulism as a possible causative factor; and Jelliffe thinks that faulty olive packing may merit consideration in this connection. Pneumonia, measles, syphilis, alcohol, and other toxins may produce mesencephalitis, which is probably not to be distinguished from the encephalitis lethargica of Economo.

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SLEEPING SICKNESS

The disease is world-wide in distribution, and may occur in epidemics or sporadically. Economo produced the disease in monkeys by inoculating them with Wiesener's diplostreptococcus.

The chief symptoms are sleepiness, which may last from two to three days to several weeks; paralysis of the ocular muscles; and, generally, mild fever. Often there is delirium, rigidity of muscles, and athetosis. The spinal fluid usually shows a slight cell increase. "The whole picture corresponds to polioencephalitis superior." Neurophagia of isolated parts is almost pathognomonic.

The disease is a true inflammatory nerve process. The midbrain is the most frequently involved part of the brain; and the author believes that the lethargy may be due to an interruption of stimuli at this point of their way to the cortex.

Prognosis by various observers is as follows: Mortality according to Netter is 35 per cent.; according to Wilson and other Englishmen, 25 per cent., and according to the Austrian observers as low as 5 per cent. When the disease involves the respiratory and cardiac centers, the prognosis is bad; but when it is localized in the midbrain, the outlook is better. Some patients recover completely. Others are left with palsies, tremors, etc. "Treatment still remains symptomatic," says Dr. Jelliffe; nevertheless several observers believe in saturating the patient with hexamethylenamin (urotropin). Some advocate administering this drug intravenously and even intraspinously.

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Surg.

SPINAL DECOMPRESSION

Operation of Spinal Decompression. Dr. N. Sharpe. Am. Jour. Med. Soc., Phila., No. 3, 335-343.

Laminectomy for spinal decompression or for exploration is not yet generally appreciated. In recent fracture of the spinal column with involvement of the chord laminectomy is urgently indicated though there is no evidence of compression. By an early laminectomy a blood clot can be removed, and what is more important, compressive edema, which always follows in such conditions, is prevented. In old fractures, where no operation had been performed, symptoms of compression may develop though X-ray findings point to no abnormal condition. But there exists usually undrained hemorrhage, later on scar tissue is formed and there are adhesions about the cord in the arachnoid and dura that lead to the formation of sacculations filled with fluid. In such cases a simple decompressive laminectomy will often give astonishing results.

There are many obscure cases of spinal-chord disease where no positive diagnosis can be made. If in such cases the symptoms persist or get worse an explorative laminectomy should always be made. While some cases may not show any improvement, in others the results are often brilliant.

The technique is as follows: A vertical incision is made in the middle line over the spinous processes. The muscles are incised close to the spinous processes on both sides and packed with hot gauze. With a broad-bladed periosteal elevator the laminæ are freed of muscles and a large self-retaining retractor inserted which checks bleeding. The ligaments of the spinous processes are divided and the processes removed by special rongeurs. The laminæ are rongeured away and the dura is exposed. The spinal cord is then explored by means of a probe. If suppuration is found in the spinal canal the

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SPINAL DECOMPRESSION

dura is not opened, otherwise the dura is incised. If a removable lesion, tumor or blood-clot is found the dura may be reclosed. If the operation is a decompressive one the dura is left unclosed to permit of decompression. The wound is closed in layers by chronic gut. A single drain of rubber running to the depth of the wound is preferable. It is removed in 24-48 hours.

Med.

SPIROCHETOSIS HEPATO-RENAL

Treatment by Intravenous Injection of Urotropin. Semana Medica de Buenos Aires.

Dr. Alfred Augusto da Mata says that in his experience the intravenous injection of urotropin always augments diuresis; increases the elimination of bile; acts as a general disinfectant of the gastro-intestinal tract, of the liver, of the kidneys and of their adnexae, destroying and eliminating the microörganisms. As a result a general sedation of all the symptoms follows. His conclusions are as follows:

1st. The urotropin must be dissolved in cold, recently distilled, sterilized water.

2nd. The solution must be prepared, fresh, for each case, in the proportion of 2 grammes to 15-30 c. c. of water, the usual dose of each daily injection.

3rd. Urotropin, employed in this way, possesses important physical and chemical therapeutic properties.

4th. By the formation of the quinotropine there is increased excretion of the urological constituents, chlorides, nitrates and urates.

5th. The preparation is easy and the intravenous injection of urotropin has no contraindications; it does not matter whether the urine is acid or whether the patient is subject to hepatic, renal, cardiac, circulatory, or nervous affections.

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SPIROCHETOSIS HEPATO-RENAL

6th. All the properties mentioned follow the daily use of the remedy in the dose and manner described; it is important that its use should not be discontinued at the beginning of improvement in the symptoms and it should be given by mouth for a time after the injections are discontinued.

Med.

STERILITY

Treatment of a Case of Sterility and Frigidity with Thelygan. (Behandlung eines Falles von Sterilität und Frigidität mit Thelygan.) Dr. O. Schlesinger. Med. Klinik, Berlin, 1920, XVI, No. 5, 125.

Thelygan is a combination of extracts of endocrin glands (ovary, hypophysis, thyroid and suprarenal glands) with yohimbine. Dr. S. mentions first the case of a woman of 38 who had four years previously been treated for a uterine myoma with X-rays. This treatment resulted in complete amenorrhea. The X-ray had evidently destroyed the function of the ovary. Thelygan treatment restored the lost function.

The second case was that of a lady of 25. Being married only two years she complained of sterility and frigidity. As the patient was found to be normal in every respect, Dr. S. ascribed the condition to faulty endocrin secretion and decided to apply thelygan treatment. He first gave the patient ten injections in twelve days. She then took three thelygan tablets for twenty days and the treatment was concluded with twelve more injections. A month after the conclusion of the treatment menstruation ceased and the lady was found pregnant. She later confessed that besides the sterility the frigidity had also been cured. The author concludes by stating that in cases of sterility due to a disfunction of the ovaries organo-

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STERILITY

therapy is valuable. He disapproves of operative interference and cervical dilatation.

Med.

SYPHILIS

A New Uvulo-Palatine Sign Found in Heredo-Syphilitic Children. (Su di un nuovo sintoma uvulo-palatino rircontrato nei bambini eredo-sifilitici.) Dr. Tanturri. Medicina prat., Napoli, No. 6, 141-144.

Hutchinson's teeth, the microrrhinia and patyrrhinia of Hochsinger, and the hypertrophy of the spine of the nasal bone discovered by Antonelli were so far the only signs known for the recognition of hereditary syphilis in children. Tanturri claims to have discovered a new sign. In examining the pharynx of small children he found on the margin of the soft palate near the anterior pillar indentations which appeared like erosions of the epithelium and mucous membrane. The loss of substance extends 1-2 mm. from the margin of the soft palate. There is no abnormal discoloration and the neighboring glands are normal. The lesion is bilateral and always very characteristic. It was found in cases where Hutchinson's, Hochsinger's and Antonelli's signs were absent. This sign was found in new-born children and in individuals up to the twentieth year. Dr. Tanturri considers this sign pathognomonic for hereditary syphilis in children.

Med.

SYPHILIS

Injections of Arsenobenzol on the Fascia Lata. (Le iniezioni di arsenobenzolo sulla fascia lata.) Dr. S. Giovannini. Policlinico, Roma, No. 31, 937-939.

The intravenous injection of salvarsan has been for a long time considered the most favorable method of introducing the remedy into

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SYPHILIS

the system. Subcutaneous and intramuscular injections have been found to be painful and frequently to produce local irritation. Wechselmann first tried injections on the fascia lata with success. His technique is as follows: The needle is introduced obliquely into the tissues until it comes in contact with the fascia lata. This is recognized from the free motion of the needle on the fascia and from the grating sensation. A small quantity of physiological salt solution (0.5 c. c.) is then injected which must regurgitate. If this does not occur the fascia has not been reached. The needle is then turned on its axis, which causes the connective tissue fibers to wind around the needle; the latter is now pushed a little farther until it reaches the fascia. The salvarsan solution can now safely be injected. The author has used this method in a great number of cases and recommends it as very practical especially in cases where the intravenous and intramuscular injections are not well borne. He adds, however, that W.'s technique must be carefully observed.

Med.

SYPHILIS

A Safe and Efficient Intensive Method of Treating Syphilis. Dr. J. F. Schamberg and Dr. R. Hirschler. Therap. Gazette, Detroit. No. 11, 761-770.

In most cases of syphilis in the primary stage, before the Wassermann has become positive, a cure can be effected by a relatively short course of intensive treatment. After the secondary stage, when spirochetes have been carried to tissues which are not easily reached by drugs, the task is more difficult. Arsphenamine is a most potent remedy. Syphilis can be cured by it alone. But the best method is to use it in conjunction with mercury.

The authors use intravenous injections thrice weekly of approxi-

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mately .3 gramme of arsphenamine and combine with this treatment inunctions of mercury on alternate days. Inunction of mercury has no irritant effect upon the kidneys with interference of renal function which might prevent the prompt elimination of arsphenamine. In a high percentage of their cases the authors have thus been enabled to reduce 4+ Wassermann reactions to negative or at least weak positives in one or two months of intensive treatment.

Med.

SYPHILIS (Early Diagnosis of)

A Correlation of Clinical and Laboratory Methods. (Review of War Medicine and Surgery.)

The laboratory diagnosis alone of syphilis presents pitfalls. The dark-field examination is of paramount importance in the early diagnosis of an untreated chancre, but its usefulness is greatly lessened as the majority of genital lesions have been treated locally before the dark-field apparatus is resorted to. The Wassermann reaction is indispensable in syphilis, but in later stages than the initial lesion. This reaction is most important in the differentiation of pathological conditions similating subsequent syphilitic lesions. A positive Wassermann reaction is the serological expression of the generalization of the disease. If a chancre is seen while the Wassermann is not yet positive, it is not necessary to await its appearance. To await its appearance as collaborative diagnostic evidence is much like the obsolete procedure of awaiting the appearance of the secondary eruption. On the other hand reliance on clinical evidence alone is insufficient, since chancres vary greatly in their clinical manifestations. Indeed, some chancres may be so atypical that reliance on laboratory tests becomes imperative in order to make a correct diagnosis. Although it is not possible to diagnose

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early all cases of genital chancres by any of the three methods, the proper correlation of the three methods promulgates differential diagnosis of genital lesions.

The importance of the early institution of treatment in the cure of syphilis places the burden of proof on the physician who classes any genital lesion as nonsyphilitic. This diagnosis should not be made until all three diagnostic methods are negative.

Dark-Field Examination. In an untreated and uninfected genital lesion the absence of *Treponema pallidum* under the dark-field is presumptive proof that the sore is not a chancre. A single negative finding, however, should never be taken as conclusive evidence, and the suspected lesion should be reëxamined at daily intervals. Unless the local condition demands treatment, the genital lesion should be dressed only with normal saline solution, boric solution, or simply warm water. No antiseptic treatment should be instituted until the diagnosis is established beyond a doubt. This is especially important because local treatment with an antispirocheticidal drug greatly decreases the percentage of positive findings. The commonly used antispirocheticidal drugs for local application are silver nitrate, mercury, iodine, copper sulphate, and iodoform. The author has observed that treponemata become very scanty on the surface of the chancre after one application of silver nitrate, which is the most powerful antispirocheticide. The dark-field became negative almost universally after one application, although it was found that discontinuance of its use allowed a reappearance of the treponemata on the surface. Two daily applications of calomel powders also caused the treponemata to disappear from the secretion of the chancre. Here again they reappear if its use is discontinued. Daily rubs with one dram of Ung. Hydrargyri are required for at least one week before the dark-field becomes negative. It may be mentioned here

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that a single injection of salvarsan usually causes treponemata to disappear from the secretion of chancres within six to eight hours. Infection of a chancre with pyogenic organisms may sometimes cause the treponemata to disappear from the surface of the chancre or reduce their number so that they can be demonstrated only with difficulty.

In previously treated chancres the serum from the deepest part of the sore should always be examined, as it is unlikely that treponemata will be found near the surface. When the dark-field examination is negative the application of alcohol to the surface of a chancre may be of service by dilating the lymphatics and so bringing treponemata to the surface of the lesion.

An added pitfall in absolute reliance on the use of the dark-field examination is apparent when it is noted that in 25.1 per cent. of the chancres in this series it was not possible to examine for treponemata because the chancre was concealed beneath an inflamed or adherent foreskin, or the chancre's surface was entirely healed.

The Wassermann Reaction. The value of the Wassermann reaction as an aid to the early diagnosis of syphilis is in proportion to the duration of the chancre. At the time of the first appearance of the sore, this reaction is invariably negative. The percentage of positive reactions gradually increases with the duration of the sore, until a short period before the appearance of the secondary eruption it becomes positive in 100 per cent. Therefore in the early period of primary syphilis this reaction is not a very valuable diagnostic aid; in the later period, however, the reaction is of considerable diagnostic value.

It is not desirable that the Wassermann reaction be employed as a diagnostic aid in primary syphilis, because the appearance of this test probably means that a general invasion of the treponemata

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has taken place. In experimental syphilis this is definitely known to be so. The disease should be diagnosed and treatment instituted before this invasion occurs. The time of appearance of a positive Wassermann reaction in primary syphilis is variable. Hence this test should be made in all cases of chancres.

The sooner the chancre is examined the more likely it is that the dark-field examination will be positive and the less likely that the Wassermann reaction will be positive. Later, however, the converse is true.

TABLE 1

Location of the chancre.	Number of cases.
Prepuce	55
Sulcus	20
Shaft	15
Glans	9
Frenum	4
Urethra	2
Concealed (phimosis)	16
Total	121
Mixed infection (chancroid and chancre)	3
Multiple chancres	21

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Med.

A BRIEF RESUME OF VERNES' METHOD FOR SERUM DIAGNOSIS OF SYPHILIS

(U. S. Research Bureau)

Biologic and Physical—Chemical Phenomena of the Serum Reaction
By Dr. Daisy M. O. Robinson, Regional Consultant, U. S. Public Health Service.

(1) Vernes ascertained that a metallic or an organic colloidal suspension in distilled water, or water containing certain electrolytes in varying concentrations, is flocculated when mixed with human-blood serum. This flocculation occurs with a definite rhythm which varies according to the quantities of serum added. There is a zone of flocculation with certain quantities of human serum alternated with a zone of nonflocculation, and one obtains a characteristic picture of interposed zones of flocculation and nonflocculation. This phenomenon ceases to take place when the quantities of serum become too minute to produce any effect upon the equilibrium of the colloidal suspension. Vernes observed this phenomenon first with the colloidal iron suspension of certain concentrations and then with several other inorganic colloids as well as with those of an organic nature.

Then these colloidal suspensions were mixed with normal human serum, the flocculation did not occur in the same quantities as it did when the suspensions were mixed with the serum from a syphilitic person; that is, the flocculation zone with normal serum did not occur with the same quantities as it did with syphilitic serum.

Utilizing this fact, Vernes proposed a method by which a normal serum could be differentiated from that of a syphilitic. His method consisted in employing such quantities of serum as those which produce a flocculation of colloidal suspension with syphilitic serum only. By using certain quantities any human serum can, of course, induce

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the same phenomenon; but this is avoided by a careful selection of quantities within which no nonsyphilitic serum can cause a flocculation.

(2) Vernes found after further experiments that an extract from the heart muscles of the horse, as obtained by a thorough extraction of substances that can be dissolved out by means of perchloride of ethyl and alcohol from thoroughly desiccated powder of the muscle (using Soxhlet apparatus at 41°-45° C. under reduced pressure), gives a colloidal suspension more stable than colloidal iron when mixed with saline water. It not only yields a finer suspension, but it enables a differentiation of a syphilitic from a normal serum with greater definition. The substances extracted with perchloride of ethyl and then alcohol from the dried powder of horse's heart muscle are called "perethynol," from per (chloride of) ethyl, and alcohol. This mass of substances contain various lipoids.

(3) In a reaction dealing with a colloidal suspension it is of the utmost importance to produce a constant suspension each time, capable of being standardized, to insure a uniform degree of molecular dispersion; otherwise the results obtained could not be compared with each other. The flocculation zone naturally shifts toward one direction or the other, according to the degree of dispersion. For this reason it was prerequisite that a scale of opacity or opalescence should be prepared for standardizing the perethynol suspension on each occasion when one was made.

This scale was devised by Vernes, who utilizes a mixture of tinctures of benzoin and quillaja with certain quantities of glycerinated water, which mixture is fairly stable if kept under certain conditions. Vernes prepared several grades of opalescence, and recommends that one of them, which he designated as grade 3, be used as the standard for the perethynol suspension to be used in the reaction. As a mat-

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ter of fact a 1/40 dilution in saline solution gives the desired opalescence; if slightly more or less, it is easily adjusted to the exact scale. Particular stress is laid upon the importance of mixing the perethynol with saline solution by dropping the latter from a burette to the former under constant agitation. A special set of apparatus (agitator, burette, etc.) is employed by Vernes.

(4) Vernes conceived the idea of translating the flocculation phenomenon into a color reaction which would be easier to measure. His idea was to find a substance which would indicate the degree of changes in the syphilitic serum by losing one of its activities while counteracting the flocculating effect of the serum upon the colloidal suspension of perethynol.

According to Vernes, a fresh serum of the pig fulfills this purpose as it acts as an antiflocculent toward the syphilitic serum and at the same time loses some of its hemolytic property upon sheep's red blood corpuscles. When mixed with a normal serum, the antiflocculent property of the pig's serum is not used up; hence there is no loss of its hemolytic activity.

According to Vernes, the degree of loss in the hemolytic power of pig's serum when mixed with the syphilitic serum and perethynol suspension corresponds with the degree of the specific changes in the human serum in question. From this he proceeded to set up an accurate determination of the change in human serum, due to syphilis, by introducing a colorimetric scale consisting of eight degrees of intensity. His scale is a series of artificial tints made to approximate those of various dilutions of laked red corpuscles. The grades are divided between 0 (absence of hemolysis) and 8 (complete hemolysis), with intermediary tints. The color scale of Vernes contains acid fuchsin, picric acid, formol, etc., and is comparatively stable in the dark. It may be seen that once a color scale is provided, it is

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easy to prepare a uniform suspension of sheep's corpuscles on each occasion by taking that concentration which will give the color scale 8 when laked in a definite (constant) volume of fluid.

(5) Pig's serum is collected at a slaughterhouse and is used within 24 hours; it should be free from red corpuscles and hemoglobin tint. The quantity used is constant in volume and hemolytic power (against washed sheep's red corpuscles). As a rule, a titration carried out in two sets of several tubes (one set with undiluted and the other with diluted serum) shows whether the sample is sufficiently strong or not. The majority of pig's serums contains enough amboceptor and complement.

(6) Sheep's corpuscles should be washed with saline solution and made up to the desired suspension. The patient's serum is heated to 55° C. for 20 minutes just before being used in the test. It must be free from hemoglobin or corpuscles (centrifugalization is employed).

(7) The following is the method of procedure: Every reagent must be contained in a constant volume (0.8 c. c.) of saline solution, except the patient's serum (0.2 c. c.). Spinal fluid is used unheated in quantity of 1.6 c. c. The tubes (11 mm. inner diameter) receive the patient's serum, perethynol suspension, and pig's serum, and are then placed in a thermostat (37° C.) for 75 minutes. At the end of incubation, sheep's corpuscles are added to all and these are once more incubated at 37 for hemolysis, which is usually complete in from 28 to 30 minutes. Those tubes which show partial hemolysis are at once centrifugalized, and the intensity of tint in the supernatant fluid is read with the aid of the artificial colorimeter. Appropriate controls are provided.

(8) A chart system of recording the colorimetric determinations on different occasions is kept for every patient and is called by

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SERUM DIAGNOSIS OF SYPHILIS

Vernes, "syphilimetrie." The chart is marked with the grades of tints from 0 to 8. It is claimed by him that the absence of the reaction beyond eight months after the treatment ceased indicates a permanent cure of syphilis.

(9) Incidental to this method, Vernes devised a rheometer (for measurement of a definite amount of serum) and an aspiropipeur (a syringe which aspirates a liquid from a container and forces it out by a piston into the test tubes) for distributing a given quantity of reagent to a large number of test tubes in rapid succession.

Med.

SYPHILIS

Public and Personal Hygiene of Syphilis.

(U. S. Research Bureau)

Summary of Facts Regarding Contagiousness.—We have now reached the point where it is possible to summarize the problem of syphilis as it concerns personal and public health. Syphilis is a contagious infection. For practical purposes, it is a danger to others only during the primary stage, the secondary stage, and such part of the latent period as may be marked by the recurrence of contagious lesions about the mouth and genitals. Any syphilitic lesion in the stages named is *dangerous if it is moist.* The sores of late syphilis, occurring as they do after the larger part of the germs have died off in the body, are not dangerous. In fact, it may be said of syphilis in general that danger is inversely proportional to glare and conspicuousness. There move among us every day persons with dangerous syphilitic lesions, for whom we would never think to turn aside, though we would shun one who had a harmless "running sore" as if he was a leper. Categorically, the important principles governing the transmission of syphilis may be summarized as follows:

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SYPHILIS

The disease is transmitted only by the transfer of the germs. Personal, immediate contact with an infectious sore or lesion stands first and foremost in the spread of the disease. The germs of syphilis cannot live long away from the body, or in the presence of air. They are killed at once by drying. They are not distributed about by objects that have only remote contact with syphilitics, such as furniture, door knobs, bath tubs, or even toilet seats. The dangerous articles are instruments recently used, articles that are put in the mouth, such as silverware, cups, pipes, etc., clothing or dressings moist with discharges. Germs of syphilis deposited on foreign objects die at once on contact with so weak an antiseptic as soap and water. The washing of all personal articles in hot soapsuds effectually sterilizes them so far as this disease is concerned.

Non-genital Syphilis.—Syphilis is non-genital—that is, the primary sore occurs elsewhere than on the genitalia in from 5 to 10 per cent. of all cases. These are older figures, and a greater expertness in recognizing the early onset of the disease will increase the amount of non-genital syphilis recognized. Physicians and nurses, and also members of families in which there is a careless syphilitic, or in which there is crowding and bad hygiene are conspicuous victims of this mode of acquiring the disease. It is said that in parts of Russia genital infection is the exception, and non-genital the rule, and the same observation was made by Tullidge in connection with Austrian troops in the war. The chancre may appear on the lip, the tongue, the eye, the finger, the nipple or any other part of the body, even to the septum of the nose and the palm of the hand.

The Engagement Chancre.—An important phase of extragenital syphilis is the syphilis of intimate non-genital contacts—kissing and caresses. Into this group fall the engagement chancre on the lips of the young girl whose fiancé acquired his infection by resorting to

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some other woman for the relief of the excitement of his courtship; the chancre on the eyelids, the lips and the cheeks of children from the kisses of infected parents or brothers and sisters, or from strangers; the chancres of the finger that are acquired in other than innocent ways.

Genital Transmission of Syphilis.—The genital transmission of syphilis covers from 80 to 90 per cent. of all cases, according again to older figures. About 50 per cent. of the infections of married women have seemed to me to be contracted in marriage, though Fournier gave 20 per cent. as his estimate. The physiological reasons for the importance of genital transmission have been discussed. No person who dispassionately reviews the facts can long cherish the belief that guilt or innocence has any part in the developments of the peculiar habits of the Spirocheta pallida, or maintain that the innocent and loyal wife or husband or the unknowing, unoffending child should be besmirched by our prurience simply because the organism is an anerobe of low vitality, requiring special conditions for its growth.

Duration of Contagiousness. Effect of Tobacco, Dirt, Etc.—The average syphilitic infection, untreated, must be rated as contagious for a period of at least five years from its onset. Lapse of time with progress toward the non-contagious tertiary, or late stage, sooner or later disposes of the public menace of every syphilitic. This is scant consolation, however, when it is recalled that the contagious periods of the diseases of children for example, seldom occupy the number of days or weeks that syphilis does years. The contagiousness of syphilis is increased by anything which tends, as do tobacco, dirt and irritation, to produce moist recurrences about the mouth and genitals. The contagiousness of syphilis is diminished, and the danger period shortened, by modern treatment.

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SYPHILIS

Arsphenamine in the Control of Contagiousness of Syphilis.—Any device or remedy which shortens the contagious period of an infection has lifesaving value. In this class we must place arsphenamine, whose ability quickly to destroy the germs of syphilis in contagious sores is one of the most brilliant contributions to the modern campaign against the disease. Quarantine for syphilis, as it is practiced in other contagious diseases, is impracticable, and fortunately it has at last become unnecessary. A twenty-four hour stay in a hospital with a single injection of "606" does away for the time being with the need of it. It should never be forgotten, however, that it is a short-sighted policy which provides only enough arsphenamine to temporarily destroy the germs. Such a policy inflicts deliberate injury upon the patient by exposing him to the risk of dangerous complications, and does not protect the public from his relapses any more effectively than the old time use of mercury. Every case must be adequately treated from the broad standpoint, as syphilis, not from the narrow point of view of merely reducing contagiousness for the time being. By adopting the former standard, and backing it with our dollars and our laws, we will best serve both the interests of the public and those of the patient himself. Good all-round treatment with salvarsan and mercury, while it can never unconditionally guarantee the non-infectiousness of a syphilitic, least of all in the intimacies of life, can none the less reduce the risk in ordinary relations practically to the vanishing point.

Personal Responsibility in the Transmission of Syphilis.—There enters into the control of syphilis as a contagious disease the same problem of personal responsibility which appears in gonorrhea. In those who are ignorant, the transmission of syphilis to others goes on unawares; in those who are indifferent, the risk of infecting others is ignored—sometimes even deliberately recognized and employed

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as a means of vengeance. The extent of responsibility in the transmission of the disease is large, and it bears no direct relation to the supposed intelligence of the person who transmits the disease. I have known Croatian laborers who barely understood the words in which they were addressed, to take precautions to protect others which conformed to an ideal code of unselfish consideration. On the other hand, I have had trained nurses, infected in illicit sexual relations, leave my consulting room after the most explicit instruction as to the danger for others, and marry healthy partners before they were non-infectious. The transmission of syphilis is too often dependent on a character factor which no amount of treatment can reach. The rapidly developing modern public health program for the control of genital infections is fortunately taking account of this phase of the problem, and is placing the irresponsible syphilitic within the grasp of the law. Syphilis gives even the conscientious patient all too few reminders of his duty. A little treatment, and everything, including the patient, vanishes. I remember in my own dispensary days the signal that marked the intention of many a patient to pronounce himself cured and disappear. A basket of tomatoes, or some fruit, or a box of cigars would appear on the window sill and then there would be a vacancy in the treatment line, perhaps all that was left to symbolize the value of hours of as ardent persuasion on my part and as a complete a good will as ever glorified an evangelist pleading for a lost soul. Now with the plenary powers of the police and the searching eye of the social worker to aid, the old-time shrug and "What's the use" that was our only resort in our struggle with irresponsibility, has lost its sardonic meaning. A great deal of syphilis can be held to treatment and to a hygiene which protects others through the personal effort of the physician. That part of it which declines the voluntary assumption of its responsibility must be forced, and forced it will be.

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Med.

TABES

Newer Methods of Treatment.—Hansell Crenshaw (*Journal of the Georgia Medical Association*) says that real progress has been made in the treatment of locomotor ataxia since the advent of arsphenamine and spinal puncture. Cures cannot be promised but records show that in many cases the sclerotic process in the cord may be arrested and that in some cases improvement has unquestionably been achieved. He reports two cases improved by intra-spinal injection of mercurialized serum (1/50 to 1/25 gr. of mercuric chloride dissolved in 30 c. c. of serum). Injections were made at intervals of ten days till the cell-count in the spinal fluid approached normal. In one case the cells dropped from 150 per cm. to 20. In the other, they decreased from 60 to 14.

Combined intravenous and intra-spinal treatment gives even better results, as suggested by C. E. Dowman. Mercurialized serum is given intra-spinously and six hours later arsphenamine is administered intravenously. Thus the choroidal plexus and meninges are stimulated to increased elaboration of cerebro-spinal fluid and to increased transfer of arsphenamine from the blood to the cerebro-spinal fluid.

Another plan of treatment which many find satisfactory is to give the intravenous injection of arsphenamine first and follow it in a few minutes by a simple lumbar puncture, draining off 20 c. c. or more of spinal fluid. This necessitates the re-formation of cerebro-spinal fluid from the blood and brings over into the ventricles and subdural space some of the arsenic compound. The writer reports one case in which the cell-count of the fluid was brought down by one treatment of this sort from 180 to 24.

Re-education of tabetics to walk is best carried out by having them practice walking straight lines with eyes raised and not look-

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TABES

ing at the ground. Later on they may practice walking short distances on level ground with eyes closed.

Mercurial inunctions applied to soles of feet every morning and KI by mouth are recommended along with the combined intravenous and intra-spinal treatment.

Med.

TESTS

Practical Manual Continuous Examination of Feces for Parasitic Ova.

Bass and Johns (Laboratory Diagnosis, Rebman Company), call attention to the necessity for the concentration of the ova in a given specimen before it should be reported negative. All of the ova in a dram of feces may be collected and placed upon a single slide. Add about ten volumes of water to the feces and shake sufficiently to obtain a proper emulsion. Place two or three layers of gauze in a funnel and filter the suspension into a tube. This removes the coarser particles of feces but allows the ova to pass through. Now centrifuge the emulsion for four to eight seconds if an electric centrifuge is used or longer if a hand centrifuge is employed. Pour off the supernatant cloudy fluid. Add more water and centrifuge again. Repeat this process until only a small amount of material is left in the bottom of the tube. Spread this on a microscopic slide and examine in the usual manner. In this manner all the ova and larvae will be collected in the small mass and if any are present they may be easily found. This is especially valuable where the clinical symptoms indicate the presence of intestinal parasites but none can be demonstrated by the usual slide method. No case should be considered negative until this method has been used in the search for ova.

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Med.

TESTS

Feces.—A Simple Method for Determining the Reaction of Feces.

Bruce describes a simple and rapid method for determining the reaction of feces (Jour. Lab. and Clin. Med., V. No. 1, p. 61). Prepare a 1 per cent. stock solution of alizarin. To perform the test place two drops on a slide 1½ inches apart, using one drop for the test and the other as a control. Dip a small glass rod in the feces and mix thoroughly in one of the drops of alizarin. A reddish-violet to violet color indicates an alkaline reaction, no change in color indicates a neutral reaction, while a light yellow color indicates an acid reaction.

Med.

TESTS

Gout.

Careful chemical examinations of the blood have revealed the fact that there is an excess of uric acid in the blood in gout. Garrod (Gould and Pyle, Fourth Edition, Blakiston) has devised a simple method for the detection of an increase in uric acid in the blood. About two drams of blood serum are obtained from a blister or from the blood drawn from a vein. Ten drops of glacial acetic acid are added. One or two linen threads are placed in this mixture for twenty-four hours. At the end of this time the threads are examined under a microscope. If an excess of uric acid be present numerous rhombic crystals of uric acid will be found. This is of value in differentiating the arthritis caused by gout from that caused by other diseases.

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Med.

TESTS

Hemoglobin in Blood.—The Determination of Hemoglobin by the Acid Hematin Method.

Berman (Arch. Int. Med., XXIV, No. 5, p. 553) has shown that the method of Sahli for the determination of hemoglobin is only accurate to within from 15 to 20 per cent. The method of the author is to use N/10 HCl as a diluent as well as for the reception of the blood. The blood is drawn in the usual manner and placed in the graduated tube of the Sahli hemoglobinometer in N/10 HCl solution. N/10 HCl is then added until the color approaches the standard. The tube is then boiled, allowing to cool for one minute and another reading taken. The N/10 solution is added again until the color exactly matches the standard. He found that determinations made in this manner corresponded very closely with hemoglobin estimations calculated from the iron content of the blood.

Med.

TESTS

The Adrenalin (Epinephrin) Test.

The Differentiation of Early Tuberculosis and Hyperthyroidism by Means of the Adrenalin Test.

Nicholson (Canadian Med. Assn. Journal, LX, No. 6, pp. 481-9) states that there are cases which show the syndrome of asthemia, fatigue, loss of strength, loss of weight, nervousness, irritability, tachycardia and slight elevation of afternoon temperature, but in which the physical, laboratory and X-ray findings do not warrant a diagnosis of incipient tuberculosis. The author thinks that many of these cases are due to hyperthyroidism and advocates the use of the adrenalin test as a means of differential diagnosis. The

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TESTS

patient is kept in bed with complete mental and physical rest the day preceding the test. A careful record is made of all signs and symptoms suggestive of vasomotor disturbances. The technique of the test is as follows: Two readings at five minute intervals of the systolic and diastolic pressure, the pulse rate and respiration are taken. The patient is then given 0.5 c. c. of the commercial 1-1000 solution of adrenalinchloride subcutaneously in the deltoid region. Readings are taken of the blood pressure, pulse rate and respiration at from five to ten minute intervals for half an hour or longer. A positive reaction is indicated by an increase in the intensity of all symptoms seen in the picture of hyperthyroidism. The blood pressure and pulse rate must show at least an increase of ten points above that recorded before beginning the test. An increase of as much as fifty points may be noted. In the course of about thirty minutes there is a moderate fall and then a slight secondary rise in the positive cases. A return to normal is seen in about one and one-half hours. Incipient tuberculosis does not give a positive test unless complicated by a coexistent hyperthyroidism.

Med.

TESTS

Typhoid.

Bass (Laboratory Diagnosis, Rebman Company) describes a bedside test for typhoid. It is based upon the fact that agglutination takes place very quickly when concentrated suspensions of bacteria are used. He recommends about two billion typhoid bacilli per c. c. as a stock suspension for the test. At first he suggested that this suspension be made in saline solution but he has found upon further study that a suspension made in distilled water retains its agglutinating properties much longer.

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TESTS

The only materials necessary for this test are some ordinary glass slides, a needle and the stock suspension of typhoid bacilli. Smears of the patient's blood are made in the usual manner as are used for differential leukocyte count or for examination for malaria. The average smear will contain approximately one-fourth drop of blood. Add one drop of water to the slide containing the smear. Tilt it from side to side and end to end so as to bring the blood into solution. As soon as this is accomplished add one drop of the standard typhoid suspension and mix well with the blood solution. If the blood contains the specific agglutinin for typhoid bacilli, the bacteria soon begin to collect together and form small grayish clumps. These soon become coarser and are readily recognized. The reaction is complete in two minutes. If the blood contains no agglutinin for typhoid bacilli no agglutination takes place and the suspension remains as it was in the beginning. The entire proceedure requires only about five minutes and may be done with facility at the patient's bedside. No microscope is necessary.

"Interpretation of the typhoid agglutination test.—About 10 to 20 per cent. of all cases of typhoid give positive reactions by the end of the first week. About 70 per cent. give positive reactions by the end of the second week. More than 90 per cent. give positive reactions some time during the course of the disease. A few do not give positive reactions at any time. A positive reaction, if accompanied by clinical evidence, is practically diagnostic of typhoid. A negative reaction does not prove that the patient has not typhoid. Its negative value is in proportion to the duration of the disease. Given a case of fever (possibly typhoid) of two weeks' duration, for instance, the indication of a negative reaction would be 70 per cent. that it is not typhoid. Here as in most other laboratory findings, the test is of most value when interpreted in connection with the

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TESTS

clinical evidence. The same test and technique may be used in the diagnosis of paratyphoid fever provided one uses similar suspensions of paratyphoid bacillus A, and paratyphoid bacillus B, in place of the suspension of typhoid bacilli."

Med.

TESTS

Typhoid.

Russo (Gould and Pyle, Fourth Edition, Blakiston) has devised a test which he claims is of more value than the diazo reaction of Ehrlich. Furthermore it is present on the second day of the fever. The technique is as follows: A few drops of methylene blue in dilution of 1 to 1000 are added to the urine. A positive reaction is indicated by the appearance of an emerald-green color. Normal urine gives a bluish-green tint. This phenomenon is absent in miliary tuberculosis, but may be present in measles and smallpox.

Med.

TESTS

Vaccines,—Standardization of Bacterial Emulsions.

Gates (Jour. Lab. and Clin. Med., Jan. 1, '20, XXXI, No. 1, p. 105) describes in detail a simple instrument for measuring the opacity of bacterial emulsions from which the number of bacteria per c. c. may be determined. The opacity of a bacterial emulsion is measured by the length of column of the suspension required to cause the disappearance of a wire loop.

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Surg.

TONSILLECTOMY

A Method of Enucleating the Tonsils Which Lessens Bleeding. Dr. P. Macdonald. Brit. Med. Jour., London, 437.

Dr. Macdonald considers the Howarth guillotine, with sharp and blunt blades, the best instrument for tonsillectomy. The blunt blade he uses only in cases where the fibrous attachments of the tonsil are so tough that they do not readily give way to the blunt blade. To obviate bleeding and to lessen the liability of the patient's either swallowing blood or sucking blood into the larynx Dr. M. adopts the following procedure: The patient is anesthetized on his back and the operation field well illuminated with a head lamp or a frontal mirror. The operator standing on the patient's left and fronting him the left tonsil is first engaged in the ring of the guillotine, the blade is shut down by the handle lever and the closed handle given to an assistant to hold. The right tonsil is then engaged with the second guillotine, the blade closed and held by the operator himself. The patient is now turned on his left side and his face turned somewhat downward. Any blood from the subsequent operative procedure will then run out of his mouth over the edge of the table. The tonsils are now removed but not by cutting or tearing, but by using the closed instrument in the same way as a pressure forceps is employed to perform torsion on a small artery. The tonsil is twisted until the pedicle of fibrous tissue, engaged between the guillotine blade and the ring, containing the principal blood vessels of the tonsil, gives way. In this manner the bleeding is reduced to a minimum.

The tonsil is removed in its capsule, and with rare exceptions. the removal is complete. If necessary adenoids are then removed with the patient's face still turned somewhat downward. On completing the operation the patient is turned completely over on his chest and face with the head hanging over the edge of the table, and

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TONSILLECTOMY

on removal to bed care is taken that the patient does not lie on his back until he has completely recovered from the anesthesia.

Surg.

TRACHEOTOMY

Tranquil Tracheotomy by Injecting Cocaine Within the Windpipe. Dr. St. Clair Thompson. Brit. Med. Journ., London, 460.

Opening the trachea is always accompanied by serious disturbance; coughing of the patient is often very severe and causes the surgeon much inconvenience. These disturbances can be avoided by the intratracheal injection of cocaine. A hypodermic syringe is charged with about 20 drops of a 2½ per cent. solution of cocaine. As soon as the tracheal rings are laid bare the windpipe is sharply stabbed between two tracheal rings. The middle ring and little fingers are resting on the neck of the patient and prevent the point from penetrating more than a quarter to half an inch within the lumen of the trachea. The cocaine solution is injected into the cavity of the windpipe, some 5-15 drops, and the needle sharply withdrawn. The liquid causes at first a slight cough. If there is no great urgency the surgeon should wait ten minutes before making the incision. The canula can then be introduced without pain, spasm or the slightest cough. The method is used with either general or local anesthesia.

Med.

TRIGONITIS IN WOMEN

Chronic Trigonitis in the Female; A New Method of Treatment; Preliminary Report. H. E. Lindeman, Surg., Gyne. & Obst.

"Irritable bladder" in women may be due to several causes. The author discusses these causes under extrinsic and intrinsic causes. He then states that there is a large group of cases in which bladder irri-

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tability is present, but with a clear urine and no gross intrinsic or extrinsic pathology to explain them. On cystoscopic examination definite changes will be found in the trigone and the term cystitis colli or trigonitis is applied to this group of cases. Knorr, who first described the condition as a clinical entity in 1900, together with Furniss, Carey, Pilcher and others agree that trigonitis is extremely common in women and one of the most frequent causes of irritability of the bladder. The etiology is obscure. It may be a sequel to a cystitis, but it more frequently comes on insidiouslv without any previous bladder or other disease.

The histological picture is that of sub-epithelial inflammation with increased vascularization and round celled infiltration beneath the stratified epithelium, the epithelium being, as a rule, well preserved. The condition may run a very chronic course and may last for years. The symptoms are usually increased frequency of urination with little or no pain and with a feeling that the bladder has not been completely emptied after urination. Some patients may reach a pitiable state from constant desire and inability to sleep or obtain any rest.

Treatment consists of local applications of silver nitrate solutions, 1 to 5 per cent., to the trigone and urethra. Prolonged treatment is often required, the treatments being given two or three times a week. Ulcers, fissures, cysts, etc., demand special treatment.

Lindeman's new method of treatment consists of injecting into the trigone, through a cystoscope and with a specially prepared needle, a solution of sterile 2 or 3 per cent. quinine and urea hydrochloride in normal saline. The injections are made at different points over the trigone until the entire area involved is covered. The object of this treatment is not to produce anesthesia but to produce permanent tissue changes. Quinine and urea hydrochloride solution in strengths of over 1 per cent. will often cause a deposit of fibrin and a con-

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TRIGONITIS IN WOMEN

sequent induration and constriction of the vessels and probably nerve fibres.

W. F. Shallenberger, in the Journal of the A. M. A., (Chronic Urethritis in Women; a New Method of Diagnosis and Treatment in Obscure Urethral Pain), reported the use of a solution of novocaine 0.3 per cent. with quinine and urea hydrochloride 0.5 per cent. in intractable cases of chronic urethritis in women with good results. The para-urethral tissue was infiltrated with the solution and the nerve supply to the urethra was completely blocked off. This gave more or less permanent relief from pain after several injections.

Med.

TUBERCULAR MENINGITIS

A Cured Case of Tubercular Meningitis. (Un caso di meningite tuberculare guartio.) Dr. M. Maurizi. Medicina nuova Roma. No. 9, 81.

It is generally believed that tubercular meningitis is incurable and must always end in death. Heubner states that no case ever recovered which showed tubercle bacilli in the cerebro-spinal fluid. But in the case reported by Dr. M. the tubercle bacillus was found in the cerebro-spinal fluid and yet the patient recovered. The case was that of a young man of 23 years. He showed all the characteristic symptoms of tubercular meningitis. The temperature never rose above 38.5. Lumbar puncture was at once carried out and 50 c. c. of cerebro-spinal fluid withdrawn.

It contained 0.50 per cent of albumen and 4 per cent. (per thousand) chlorides. This is of diagnostic importance, since the French clinicians state that if the chlorides fall 6 per mil. we may assume a tuberculous meningitis. The bacteriological examination revealed numerous tubercle bacilli. After the lumbar puncture the

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TUBERCULAR MENINGITIS

patient began to improve. On the third day a second injection was made and a third on the sixth. On the twentieth day the patient left the hospital entirely cured.

Med.

TUBERCULOSIS

Evolution of the Initial Lesion of Pulmonary Tuberculosis in Early Childhood. (Evolution de la lésion initiale de la tuberculose pulmonaire chez l'enfant du premier age.) Dr. Ribadeau-Dumas and Dr. Béclère. Bull. et mén. Société méd. d. hôpitaux de Paris. No. 23, 651.

A breast-fed child was at nine months given in charge of a coughing and expectorating nurse who suffered from pulmonary tuberculosis. Five months later the child took sick, lost his appetite and the temperature rose above 40° C. An X-ray examination showed absolute solidity (splenopneumonia) of the whole right lung with complete disappearance of vesicular murmur. The child is pale, has no appetite. After three weeks the fever slowly sinks, the solidity of the lung decreases. But the patient loses flesh, stools are frequent and thin. An X-ray picture shows a distinct shadow in the right interscapulo-vertebral space. The tracheo-bronchial glands were evidently affected. In spite of these serious conditions the child gradually recovered. Six years later, when the patient was seen again, he was healthy and strong. The child had thus developed a bacillary pneumonia resulting in disease of the tracheo-bronchial glands, but the inherent powers of the patient completely overcame the disease.

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Med.

TUBERCULOSIS

A New Antitubercular Preparation, Sclerolysin. Barberi. (Di un nuovo preparato antitubercolare, la sclerolisina Barberi.) Dr. F. Taliani. Gazz. med. di Roma, No. 15, 141-152.

The new preparation, which was worked out by Dr. Barberi, is injected intramuscularly and contains iodine, phosphorus, arsenic and calcium in a form which is easily tolerated by all patients. This preparation has the advantage of uniting all the elements now used in the treatment of tuberculosis in a formula which expresses the highest therapeutic value and which is perfectly stable. It is not only a mixture of the salts of phosphorus and arsenic, but contains a new combination of iodine and calcium, to which Dr. Barberi gave the name of iodocalcine, and it is above all the latter combination which gives the preparation its great therapeutic value. A great number of cases have been treated with intramuscular injections of this preparation with remarkable success. Cases of pulmonary tuberculosis with fever, hemoptysis, great loss of flesh and abundant expectoration have, in the course of a few months, been freed from these severe symptoms and regained strength and increased their weight. Cases of glandular tuberculosis with fistulous sinuses were completely cured in a relatively short time.

Med.

TUBERCULOSIS

Note on a Method for the Sedimentation of Tubercle Bacilli in Sputum. Dr. J. G. Greenfield and Dr. J. Anderson. Lancet, London, 423.

The method described is more practical and reliable than any other method of sedimentation. The procedure is as follows: 5 c. c. of sputum are mixed with twice their volume of

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TUBERCULOSIS

Sod. carb. (cryst.) 1
Acid carbolis. (cryst.) 1
Water 100

in a centrifuge tube; the tube is then covered with a rubber cap, shaken for a few minutes and put in the incubator. After 12—24 hours the tubes are taken out and centrifugalized for about 15 minutes. The supernatent fluid is poured off and films made from 2 to 4 loopsful of the deposit are stained in the usual way. Advantages: 1. Great rapidity. 2. Sputa when taken out of the incubator are sterile in most cases. 3. Films resemble the direct smears both in relative proportion of other organisms present and in the presence of mononuclear and polymorphonuclear cells, but the mucus is not stained.

Med.

TUBERCULOSIS, GLANDULAR

Radium in the Treatment of Tuberculosis Adenitis. Dr. E. S. Molineux. Brit. Med. Jour., London, 705.

The author has had great success with radium in the treatment of glandular tuberculosis. He is convinced that operative treatment will soon be a thing of the past. Radium is safe and certain whether in an early or advanced stage of the disease. Dr. M. treated more than twenty cases of every grade with radium. In every case the swellings old sinuses faded away. In no case was ulcera-

ms of radium bromide, spread out on a flat cir-
¼ inch in diameter and mixed with a special
en and prevent loss, is sufficient for this treat-
has a screen of silver 1 mm. thick and a piece

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of thin guttapercha tissue tied over the whole to prevent soiling of the radium. The applicator is strapped over the tuberculous glands. Ten hours is a suitable time for each application for the above strength, i. e. 150 milligram hours. The applicator is applied in the evening and taken off in the morning. A different gland or group of glands is treated at each sitting, till all have been covered, and the course then started anew. The patients usually get two applications a week. The cases reported have all been treated in 1913 and 1914 and none have shown any signs of recurrence since. Carious teeth and unhealthy tonsils should be dealt with before treatment is undertaken, to prevent recurrence.

Med.

TUBERCULOSIS (MESENTERIAL)

Diagnostic Errors in Tuberculosis of the Mesenteric Glands with Special Reference to Appendicitis. (Diagnostische Irrtümer bei Mesenterialtuberkulose under besonderer Berücksichtigung der Appendicitis.) Dr. W. Keppler and Dr. F. Erkes. Med. Klinik, Berlin, No. 13, 301-303.

It is a well-known fact that many diseases hide themselves under the symptom picture of an appendicitis. This is especially true in diseases of the female genital organs, in extra-uterine pregnancy, typhoid fever, perforation of gastric and intestinal ulcers, etc. But that tuberculosis of the mesenteric glands may present the symptoms of appendicitis has so far not been mentioned in medical literature. The authors report six cases where the symptoms pointed to an appendicitis while the subsequent operation revealed glandular tuberculosis. The glands affected in these cases were caseified and situated in the ileo-cecal region. The authors also observed cases where tuberculosis of the glands in the mesentery of the small intestine and of

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TUBERCULOSIS (MESENTERIAL)

the transverse colon presented the symptoms of gastric and duodenal affections. When, therefore, at the operation the findings are negative the authors recommend to examine the mesentric glands and to extirpate them if found tuberculous. This results in a permanent cure. X-ray treatment is not advisable.

Med.

TUBERCULOSIS, PULMONARY

The Action of Sugar on Pulmonary Tuberculosis. (Lazione degli zuccheri sulla tubercolosi polmonare.) Dr. D. Lomonaco. Medicina nuova, Roma, No. 9, 82-84.

Dr. Lomonaco found by experiments on goats that the subcutaneous injection of a small quantity of a sugar solution increased the secretion of milk and that the injection of a large quantity decreased the lacteal secretion. He made practical use of these facts to increase the lacteal secretion of young mothers with insufficient milk. Further experiments showed that also other secretions (salivary, gastric, pancreatic, biliary, etc.) were similarly affected by injections of sugar solutions. Dr. L. applied these injections in cases of pulmonary tuberculosis and found that the expectorations were greatly decreased even in the most serious cases. Hemoptysis disappeared and cough and night sweats greatly diminished. For this treatment he used daily one injection of 5 c. c. of a sugar solution or two injections daily of 2.5 c. c. each.

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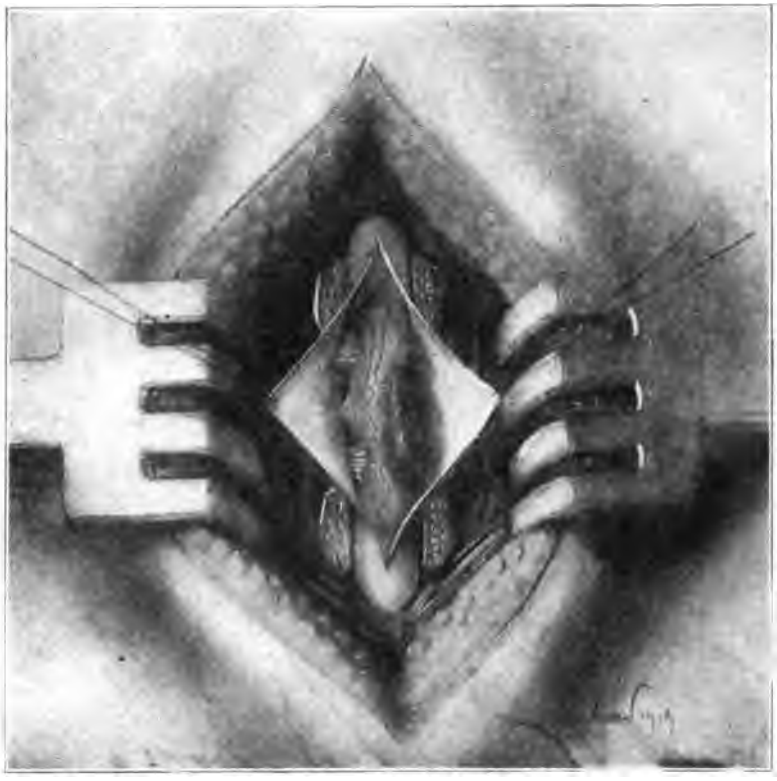

FIG. 1.—Spinal cord tumor (fibroma) on the posterior surface of the cord near the median line.

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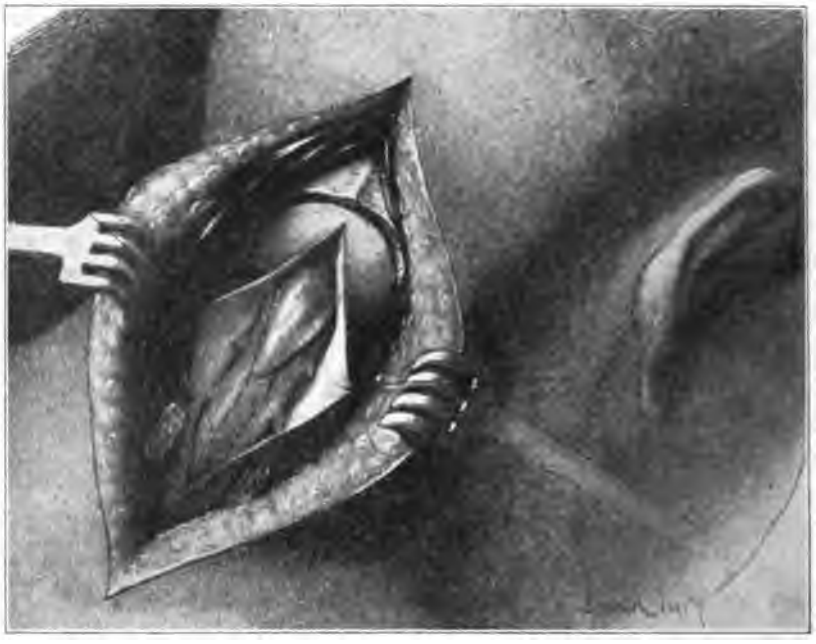

FIG. 2.—Mrs. G. Intradural dermoid cyst lying on the posterior surface of the upper cervical cord and projecting into the posterior cranial fossa.

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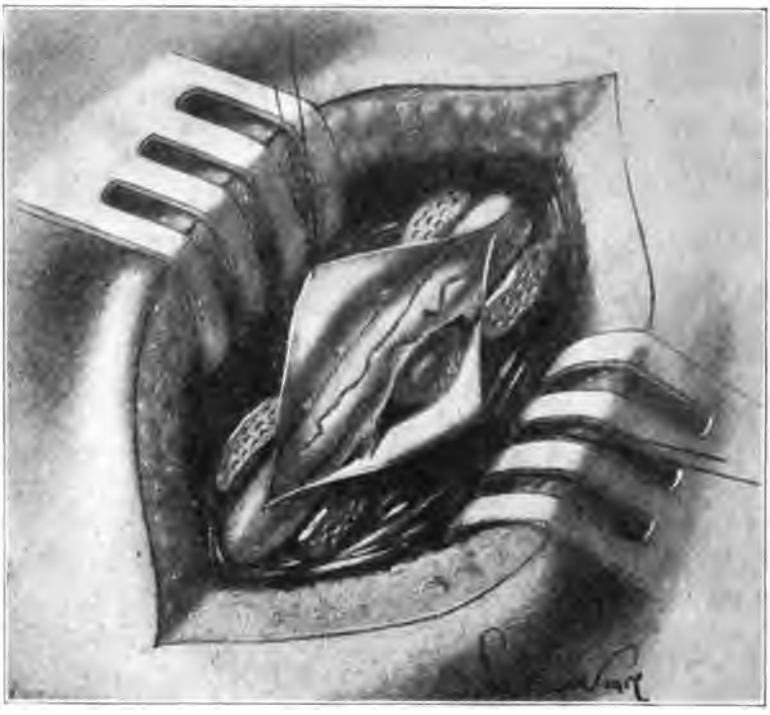

FIG. 3.—F. G. Extramedullary tumor lying behind a posterior spinal root on the side of the spinal cord.

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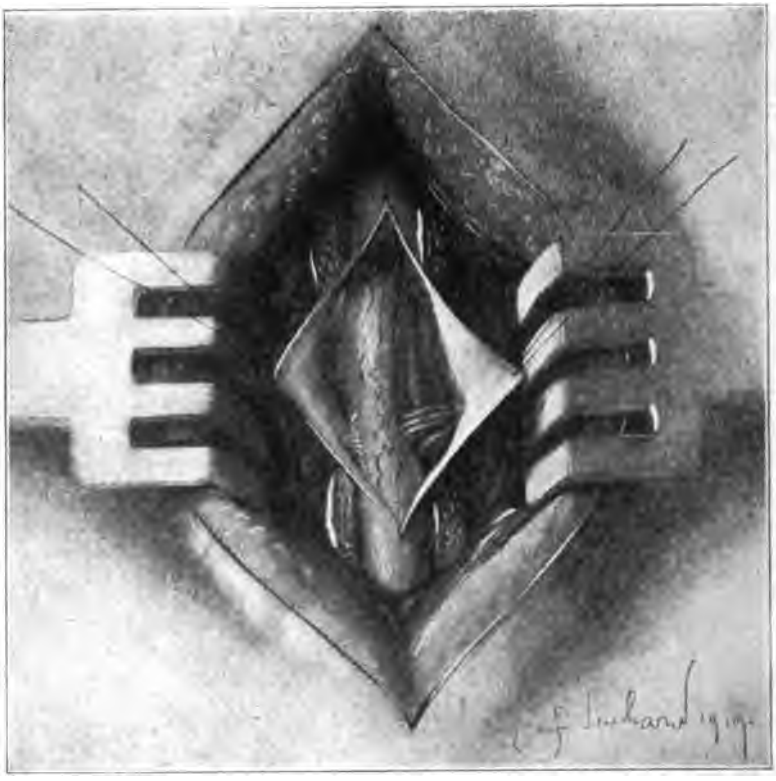

FIG. 4.—Extramedullary tumor lying in front of a posterior spinal root.

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Surg.

TUMORS

Spinal Cord Tumors and Their Surgical Treatment. Dr. Charles A. Elsberg, American Jour. of the Medical Sciences.

Frequency and Level.—Spinal tumors occur most often outside of the cord. They originate either from the cord itself, from the spinal membrane, or from the soft tissues surrounding the dura. Of 67 spinal tumors operated upon by the writer, 49, or almost three-fourths, were extramedullary, and 18, or one-fourth, were intramedullary. In 42, or 62 per cent. of the cases, the new growth occurred inside of the dura mater.

Spinal tumors are met with most often in the cervical and dorsal regions and between the roots of the cauda equina. Thus of the 67 cases of our series, in 27 the tumor lay somewhere between the fifth cervical and the third dorsal and in 21 between the ninth dorsal and first lumbar segments; in 11 between the lower end of the spinal cord and the roots of the cauda equina. The extramedullary growths occurred with about equal frequency at the cervicodorsal and dorsilumbar levels, while intramedullary tumors were met with twice as often in the cervicodorsal as in the lower levels of the cord.

The Relations of the Tumor to the Spinal Cord and to Its Surroundings.—Tumors are most frequently met with on the posterior aspect of the spinal cord. They often lie in or near the median line over the origins of the posterior spinal nerve roots; they may develop more to one side of the cord behind the roots of that side (Figs. 1, 2, and 3).

As the dentate ligament marks the boundary between the anterior and posterior halves of the cord, any tumor that develops behind the dentate ligament must be considered as lying on the dorsal aspect of the cord. Some growths develop in front of the posterior roots,

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but behind the dentate ligament, and these stretch the posterior roots as they enlarge (Fig. 4). These growths are most liable to cause severe root pains from the beginning of the symptoms. In a patient with a suspected spinal cord tumor, unilateral root pains, followed by cord symptoms, for a long time referable to that side of the cord, justify the probable diagnosis of a cord tumor which has developed under one or more posterior spinal roots.

If these patients are seen in a relatively early stage of their spinal cord symptoms a typical Brown-Séquard syndrome may be observed. While an indication of a Brown-Séquard picture—more motor disturbances on the same side and more marked loss of sensation on the opposite side—is seen in all but the advanced stages of the disease a typical Brown-Séquard syndrome is most liable to occur in these extramedullary growths which develop posterolaterally between the dentate ligament and the posterior spinal nerve roots. These tumors develop either from the pia arachnoid covering of a posterior spinal root or from the general pia or arachnoid. Undoubtedly they often increase in size very slowly, so that many months, perhaps years, may elapse before they have grown sufficiently to compress the spinal cord.

The dentate ligament probably offers considerable resistance to the forward enlargement of the new growth, and the nerve roots may be so tightly stretched over the latter that they have to be divided by the surgeon before the tumor can be removed. These lateral growths are liable to push the spinal cord markedly to the opposite side of the spinal canal.

Of the extramedullary (intradural) tumors of our series above the level of the cauda equina, 24, or 77 per cent., lay either on the posterior surface of the cord or posterolaterally, and 14 of the 18 cases of intramedullary tumor seemed to occupy more especially the posterior parts of the spinal cord.

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FIG. 5.—Extramedullary tumor lying on the anterolateral surface of the cord in front of a slip on the dentate ligament.

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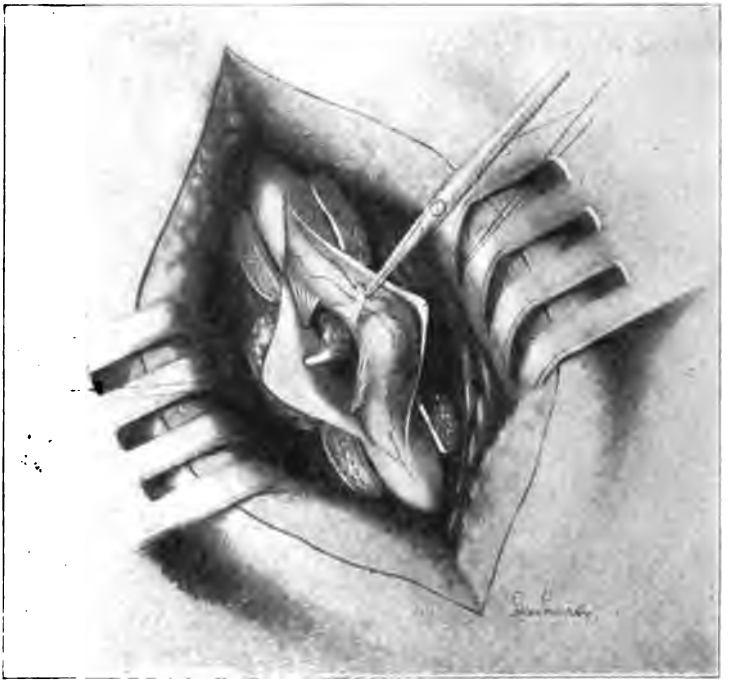

FIG. 6.—Exposure of a tumor lying in front of the spinal cord by traction on a slip of the dentate ligament. (Note that the growth is an extension of an extradural tumor.)

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TUMORS

In seven patients with extramedullary tumors (88 per cent.) the growth was found either anterior or anterolateral to the cord. Here again the tumors may develop either in front of the spinal cord and the anterior spinal roots or anterolaterally between the anterior roots and the anterior surface of the dentate ligament. When these growths are exposed by the surgeon they are usually found to be covered, on their posterior surface, by the dentate ligament or one of its slips. Usually, one of the attachments of the ligament to the inner surface of the dura has to be divided and the ligament has to be retracted before the tumor can be sufficiently exposed for its removal (Figs. 5 and 6).

These anterolateral growths only rarely begin with root pains; their course is often a painless one and it is frequently difficult to differentiate them from intramedullary growths.

It is often impossible to decide upon the part from which an extramedullary tumor has originated. If a growth is attached only to the inner surface of the dura it has very probably originated from that membrane. Likewise, if the tumor is not adherent to the dura and does not involve any nerve root it must be derived either from the arachnoid or pia mater; in this connection it is well to remember that tumors which arise from the pia are much more closely adherent to the cord than arachnoid new growths.

If the tumor is found to be adherent to several of these structures its origin cannot be determined with certainty. It is sometimes very difficult to differentiate between a subpial or septal new growth and a true intramedullary one. These septal and subpial tumors may be surrounded on all sides by cord tissues, and for their removal an incision into the cord may be required. It may very well be possible that some of the growths we have described as intramedullary were really examples of septal or subpial tumors which had grown into and become buried, as it were, in the tissue of the cord.

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TUMORS

Injury to the Cord by a Tumor in Its Proximity.—Every expanding lesion within the spinal canal will, sooner or later, exert pressure upon the spinal cord, but the amount of compression is not directly proportionate to the size of the growth or its duration. Large tumors are more liable to be of softer consistency than small ones, and it is the small, hard tumors that cause, in many instances, early severe damage to the cord structure.

It is often impossible to determine from the appearance of the cord at the time of the operation how great the actual damage has been. Nor can deductions be drawn from the symptoms and signs which the patient presents. If a flaccid paraplegia with loss of all reflexes is present, or if such a condition has existed for a considerable period, it is very probable that the cord lesion is an irremediable one. This does not mean, of course, that there may not be some return of power and of reflexes after the removal of the tumor, but the chances for an amount of improvement that will be functionally valuable for the patient are very slight. The majority of these patients with advanced signs of cord compression, however, have a spastic paralysis which is either a paraplegia in flexion or in extension. Some of the patients, even after years of spastic paraplegia, begin to improve after the removal of the tumor and may recover a very satisfactory amount of power; others never improve enough to gain even a small amount of control of their limbs. When the tumor is in the cervicodorsal region the improvement of the upper extremities may be very marked while that of the lower limbs may be very slight.

The lumbosacral cord is very vulnerable as far as the centers for the bladder and rectum are concerned, and loss of control of urine and feces persists even after the disappearance of all other symptoms.

From the appearance of the cord at the time of the operation no conclusions can be drawn regarding the amount of improvement that

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FIG. 7.—E. S. Dual endothelioma which has markedly flattened the cord.

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FIG. 8.—Mrs. H. Small dual fibroma which has caused a localized depression in and softening of the cord.

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FIG. 9.—Mrs. R. Small tumor, under the left roots of the cauda equina, compressing the conus.

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can occur. As it is always inadvisable to handle or even touch a part of the cord that has been subjected to pressure for a long time the operator can seldom determine the exact condition of the affected cord. It is quite astonishing, however, how great an improvement may occur in a cord that appears at operation to be flattened to a thin tape size. As I have already stated, much greater improvement may be expected in a flattened cord than in one in which there is a deep depression from a small hard tumor (Figs. 7 and 8).

It is never possible to say what improvement will follow the removal of a localized intramedullary growth by the method of "extrusion." We have seen some excellent recoveries but have had many disappointments. The majority of intramedullary tumors are infiltrating in character and the destruction of cord tissue is usually extensive.

What has been said of the tumors that compress the spinal cord holds true, in a general way, for those that develop between the roots of the cauda equina. As the lower end of the spinal canal is relatively large the tumor must have attained a considerable size before all of the caudal roots are affected. The most frequent form of new growth in the caudal region is one which is soft, and which attains a very large size, and is usually firmly adherent to the different nerve roots. To entirely remove these large growths would require the resection of a number of the nerve roots, which is, of course, not permissible or an amount of handling of the roots which would be tantamount to their destruction. Small tumors between the roots of the cauda equina are relatively rare (Fig. 9) and the injury to the nerves can be fully recovered from. It is remarkable, however, how sensory disturbance may be caused by the large tumors which so often fill up the entire lower end of the spinal canal and envelop each and all of the nerves of the cauda equina.

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TUMORS

Concerning Diagnosis.—The diagnosis of an extramedullary spinal cord tumor, when the symptoms and signs are well marked, is, in the majority of instances, comparatively easy for those experienced in this field, and most of the patients were sent to us, for surgical interference, with the diagnosis of "cord tumor" already made. The most frequent difficulty experienced was to distinguish between true spinal cord neoplasm and malignant vertebral disease, because malignant disease of the bone may be slow in its development, the onset of the spinal symptoms gradual, and the roentgen-ray picture negative. The diagnosis is not difficult if there is a history of primary disease in some other part of the body; but in the cases of primary vertebral disease or at least a disease of the vertebrae in which no primary lesion in any other part of the body can be discovered, the diagnosis is often difficult.

The back of every patient in whom a spinal tumor is suspected should be carefully examined. In patients who are unable to sit up and who have to be turned on the side, we have sometimes found a small swelling to one or the other side of the vertebral spines only after repeated examinations.

Although the spinal cord symptoms which occur with malignant disease of the neighboring bones are usually sudden in their onset and progress within a few days to complete flaccid paraplegia, the symptoms may develop more gradually. In these patients the differential diagnosis may be difficult. We do not know, in many of the cases, whether the spinal symptoms are due to a toxic or circulatory softening of the cord, because in not a few instances the malignant growth has not made any direct pressure upon the spinal cord.

The diagnosis of "spinal cord tumor" was made more and more early as we gained experience with these cases. Many patients had to be watched for months or years before the diagnosis could be

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made, for a neuralgia has no significance so far as the spinal cord is concerned until some symptoms referable to the spinal cord have appeared. Many of our patients had been, of course, treated for neuralgias or for vertebral diseases for considerable periods, and some had been operated upon for suspected intra-abdominal conditions before the cord symptoms had become manifest.

The diagnosis of "intramedullary tumor" is more difficult, and in many of the patients upon whom a laminectomy for intramedullary disease was performed by us we were uncertain as to whether the disease within the substance of the cord was neoplastic or degenerate.

Of the 67 patients in our series the diagnosis of tumor was made or suspected 60 times; in the seven other patients a tumor was considered one of the possibilities. In order to obtain a fair idea of the diagnostic possibilities, however, all of the operated patients should be mentioned in whom a tumor was considered either certain, probable or possible. In all there were 105 patients in this category. In 70 patients the diagnosis of tumor was made or considered probable and in 60 of the patients a tumor was found at the operation. In 35 patients a tumor was considered possible but not probable; in only 7 of these was a tumor found at operation, and 5 of the 7 patients had an irremovable intramedullary growth. The 28 patients in whom a tumor could not be excluded and in whom an exploratory operation was performed, suffered from one of the following conditions: malignant disease of the spine, pachymeningitis, adhesive arachnitis, neuritis of the cauda equina, multiple sclerosis, gliosis, funicular myelitis, abnormal spinal vessels with intramedullary disease. Thus it will be seen that, in our experience, the diagnosis of "spinal cord tumor" was made correctly in the majority of the patients (60 out of 70 cases). When the diagnosis could not be made but a

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neoplasm was considered possible, though not probable, there was no tumor in most of the patients (28 out of 35 cases).

In one patient the level symptoms pointed to lesion at the sixth dorsal segment, but the tumor was found at a second operation at the twelfth dorsal segment. In two other patients the diagnosis of a tumor at the level of the twelfth dorsal segment was made. The operation failed to expose the growth. A year or more later, in each patient, there were clear level symptoms in the cervical region, and in both instances I removed the tumor from the lower cervical region at a second operation.

The Surgical Treatment.—If an extramedullary tumor has been exposed by laminectomy and incision of the dura its removal does not, in most instances, present any technical difficulties. If the growth lies on the posterior surface of the cord and is not adherent to that structure it can often be "picked out" of the spinal canal with the division of perhaps only a few fine adhesions. If, on the other hand, it lies under a nerve root or in front of the dentate ligament of the cord itself the manipulations must be very carefully accomplished. It is always inadvisable to attempt to pull out a tumor from under a nerve root, as such a procedure might cause serious injury to the cord. Either the nerve root or roots must be carefully raised and pulled apart by fine strabismus hooks, or if sufficient room cannot be gained the roots must be divided.

Similarly the surgeon should never attempt to pull out a tumor from under a slip of the dentate ligament. The slip should be divided and retracted in order to expose the new growth. When a tumor is to be removed from in front of the cord the following procedures are of value: By the division of one or two slips of the dentate ligament and of one posterior nerve root (if necessary) the cord can be pulled well to one side. This should be done with forceps which grasp the

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slips of the dentate ligament which have been divided and not by direct pressure upon the cord. The operator should never make the attempt to pull the cord to one side by means of traction on one or more nerve roots. A pull on a nerve root sufficient to draw the cord to one side is almost certain to injure the cord itself.

Another important detail in the exposure and removal of tumors which lie in front of the cord is to remove much more of the laminae on one or other side, so that the access to the front of the cord from that side is made more direct.

If the neoplasm is found to be closely adherent to the cord the greatest possible gentleness should be used in separating it from that structure. Tumors which have originated from the pia mater on the cord are sometimes so firmly adherent that in their removal a small layer of cord tissues would come away with the growth. If the adhesion is a very firm one it is preferable to leave behind a small piece of the capsule of the growth.

If the neoplasm is not found at the exposed level a careful search must be made for it. The appearance of the veins on the posterior surface of the cord is very characteristic when there is an obstruction to the return flow of blood at a higher level. In addition a probe should be carefully passed upward and downward on the posterior and anterior aspects of the cord. An elastic resistance is often felt when the end of the probe impinges upon a tumor higher up or lower down than the exposed area. Mistakes may, however, occur when the end of the probe is caught in a nerve root, in an adhesion between the arachnoid and the dura, or is obstructed by a swollen cord or one of the normal curves of the vertebral column. If there is no escape of cerebrospinal fluid from above and such an elastic resistance to the progress of the probe is encountered, especially if there is a venous congestion of the cord, a tumor at a higher level than that exposed is very probable.

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Med.

TYPHUS FEVER

The Value of Pyramidon in Febrile Infectious Diseases from Observations on Typhus Fever. (Ueber die Pyramidonwirkung bei fieberhaften Infektionskrankheiten; nach Beobachtungen beim Fleckfieber.) Dr. J. Schürrer. Berlin. klin. Wochenschr., No. 15, 337-339.

Typhus fever is always accompanied by extreme mental excitement, hallucinations, delirium, etc. The restlessness and motor excitement is so great that the patients require very close watching day and night. On these conditions the pyramidon treatment has an extremely beneficent effect. Besides its marked antipyretic action pyramidon influences directly the sensory apparatus. It quiets the motor excitement, the anxiety, delirium and hallucinations disappear. Schürrer treated 25 typhus cases with pyramidon. He administered daily five times .2 c. c. of the drug. Pyramidon acts very slowly. It is questionable if the mortality of typhus fever can be reduced by this treatment, but it is noteworthy that of the 25 cases treated by Schürrer with pyramidon only one died.

Surg.

ULCERS

Treatment of Obstinate Cutaneous Ulcers on a Cicatricial Basis. Die Behandlung schlechtheilender Hautgeschwüre and narbiger Grundlage.) Dr. T. Walzberg. Zentralblatt f. Chir., Leipzig, No. 18, 328.

In order to obviate the tension of the soft parts surrounding the ulcer and which prevents healing Dr. W. uses the following method: He makes an incision all around the ulcer about 1 cm. (½ inch) from the edge of the ulcer. It does not matter if the incision passes through cicatricial or through healthy tissue. Then the ulcer is excised if pos-

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ULCERS

sible with its base. Now the cicatricial skin is separated as thick as possible from its base all around, the knife being held parallel with the surface of the limb. Thus the edges can be brought together and sutured. The hemorrhage, which is sometimes marked, is easily stopped by compression. It is quite frequent that the sutures suppurate and the edges separate. But this does not matter. After six or eight days when granulation has set in in the floor of the ulcer circular adhesive strips are applied to draw the edges together and the ulcer will heal rapidly. Dr. W. has used this method not only in small but very large ulcers with complete success.

Surg.

URETEROCYSTONEOANASTOMOSIS

Replacement of the Lower Half of the Ureter by Vesical Mobilization and Plastic Bladder Surgery. (Ersatz der untern Hälfte des Ureters durch Blasenmobilisation und Blasenplastik.) Dr. B. von Mezö. Deutsche med. Wochenschr., Berlin, No. 8, 219.

The immobility of the bladder is chiefly due to the median umbilical ligament. This ligament can easily be cut retroperitoneally. The peritoneum is first loosened from the bladder. When the ligament is cut the posterior surface of the bladder is easily freed as far down as the trigonum and the bladder thus forms a sack which is only connected with the urethra, and can be drawn up as far as the middle of the ilium. In most cases this mobilization of the bladder is sufficient for implantation of the shortened ureter but in cases where a greater lengthening is desirable the author makes a transverse incision to the length of 5 or 6 centimeters on the anterior surface of the bladder. The wound margins are then brought together lengthwise and sutured. The bladder is thus very much lengthened, and the apex of the bladder can easily be drawn up to the level of the crest

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URETEROCYSTONEOANASTOMOSIS

of the ilium. In this manner it is possible to replace 16 to 20 centimeters of the lower part of the ureter. As to the technique of the ureteral implantation the author recommends that of Sampson as the most reliable and safest.

Med.

UTERINE APPENDAGES, TUMORS

Treatment of Inflammatory Tumors of the Uterine Appendages with Turpentine Injections. (Ueber die Behandlung entzündlicher Adnextumoren mit Terpentineinspritzungen.) Dr. B. Zoeppritz. Zentralblatt f. Gynaek., Leipzig, No. 16, 297-299.

Success with turpentine injections in the treatment of gonorrhea in the female has been reported by several German writers. Dr. Z. also applied this treatment to other inflammatory conditions of the uterine adnexa and especially to tumors of the appendages. He used an oily dilution of turpentine (10 pts. turpentine to 40 pts. olive oil). 0.5 c. c. of this solution was injected down to the bone in the posterior axillary line, three fingers breadths below the crest of the ilium. The injections were made every fourth or fifth day. In some cases as many as 11 injections were needed. Fever is no contraindication to the treatment. On the contrary in almost all cases the temperature fell at once. At first the pain in the abdomen is increased, but later the patients show great improvement in their general condition. Of the thirty patients thus treated a number have been entirely freed from their complaint, the others are still under treatment. Only one case showed no improvement. In this case the operation revealed two tuberculous pus cavities. This would indicate that tuberculous processes are not affected by this treatment. But in another case, which was diagnosed as tuberculous, two large tumors disappeared completely under turpentine treatment.

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Med.

UTERINE FIBROIDS

The Treatment of Uterine Fibroids by X-Rays. Dr. J. D. Harris. Brit. Med. Journ., London, 376-378.

X-ray treatment of fibroid tumors of the uterus has been practiced for several years but its beneficial effects, especially in bleeding fibroids, are not generally known. The cycle treatment as practiced by Dr. Bordier of Lyons seems to be the best form of application. He gives a series of cycles, each consisting of nine sittings. Thus he gives a sitting to the right ovary, one to the left ovary, and one centrally over the uterus. This is repeated three times, making nine exhibitions of X-rays. These exhibitions may be arranged according to the convenience of the patient; two may be given on the same day, or one may be given on alternate days. Usually after the first cycle of nine exhibitions there is a slight increase of the flow of blood at the next period. Twenty-one days after the first cycle a second is given, and at the next period the hemorrhage is usually less. After the third and fourth cycle there is generally great improvement, and in many cases the menopause is established. More than six cycles are seldom needed.

This then is a method of hastening the menopause, when myofibromas shrink and cease to bleed. The nearer the patient is to the climacterium the more successful is this treatment. It should be added that this form of treatment is not applicable to women below 30 or 35, nor to those who have the subperitoneal form of uterine fibroma. In this article the author gives the details of 18 cases from his practice. They were all successfully treated with X-rays. He earnestly recommends this form of treatment to the general practitioner, for there are numerous women who will prefer this treatment to a formidable operation.

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Med.

UTERINE INERTIA

Formiate of Quinine in Uterine Inertia. (Il formiato di chinina nell' inerzia uterina.) Dr. A. Fortunato. Clinica obstet., Roma, No. 9, 209.

Pituitrin, an extract of the posterior lobe of the hypophysis, is an efficient remedy in uterine inertia, but it is contraindicated in patients with cardiorenal lesions accompanied by hypertension. As the formiates exert a marked stimulating action on the muscles, and as quinine is a strong ecbolic, Dr. F. combined the two with good results in cases of uterine inertia. The injection is well borne. After about 15 minutes the contractions of the uterus begin preserving the physiological rhythm. This remedy can be used in all cases as it presents none of the contraindications of the hypophysial extract.

Med.

UTERINE TUMORS

Radiotherapy of Uterine Fibromyomata; Results, Mode of Action, and Indications Based on 400 Personal Cases. (La radiothérapie des fibro-myomes utérins; résultats, mode d'action et indications d'après une statistique de 400 observations personnelles.) Dr. Béclère. Bull. gén. de thérap., Paris, No. 16, 702-713.

In the treatment of uterine myomata Dr. B. has used the X-ray with splendid success. In the majority of cases treated hemorrhage was a predominant symptom. In all cases the hemorrhage was stopped and the tumors were not only arrested in their growth, but were greatly reduced in size. With the arrest of the hemorrhages menstruation also ceased and this artificially produced menopause was usually permanent.

The author gives the following technique: The X-rays are applied once a week. Each time two applications are made, one on

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UTERINE TUMORS

the right and one on the left of the median line, just above the pubic bone. When the uterus is retroflexed or the tumor occupies the cavity of the sacrum a third application is made over the sacral region. If the tumor is extremely large several applications are made over the abdominal area. Each application is limited to an area of 10 cm. in diameter by a cylindrical lead-coated glass which is impervious to X-rays. A thin wooden disk is placed between the localizing cylinder and the abdominal wall. This disk flattens the skin and by a gentle pressure reduces the distance between the ovaries and the integument. The radiating source is from 18 to 22 centimeters from the surface of the skin. A Coolidge apparatus is used with an aluminum filter of five millimeters. Each application lasts five minutes. As to the dose, measured by the Sabouraud-Noiré method, it never exceeded 8½ units. In 60 per cent. of the cases the average treatment required from 12 to 14 weeks. The lowest number of sittings required was four, the highest fifty. The only danger of the treatment lies in too large a dose, producing cutaneous lesions. All other alleged dangers are imaginary.

Med.

VACCINATION.

Vaccination by Subcutaneous Injection. Dr. J. R. Goodall. Lancet, London, 285.

The author vaccinated more than 6,000 soldiers and a number of children by subcutaneous injection. The vaccine was put up in small capillary glass tubes. These vaccine tubes were first placed in methylated spirit for a few minutes, then withdrawn by clean hands, the excess of alcohol wiped off with sterile absorbent cotton, the ends broken off, a sterile rubber bulb fixed to one end of the tube to blow out the vaccine into a sterile beaker. When the vaccine available

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VACCINATION

was in small wax tubes, the extreme end was punctured with a sterile needle and the contents squeezed out by compressing the container. From one-half to three-quarters of a tube was used per individual. Sufficient sterile water was then added to make each injection equal to 1 c. c. The arm was sterilized with iodine and the vaccine injected diagonally with a fine hypodermic needle into the subcutaneous tissue. The reaction is sometimes considerably delayed but does not differ from the ordinary vaccination. Among the more than 6,000 cases there was not one case of infection. No dressing was needed. Advantages: A clean surgical operation. No risk of secondary infection. No dressing needed. Painlessness. Children bear it well.

Surg.

VARICOCELE

A New Operation for the Radical Cure of Varicocele. (Nuovo metodo operativo per la cura radicale del varicocele.) Dr. E. Lay. Policlinco. Roma, sez. prat., No. 14, 429.

The scrotum is vertically incised to the length of 5 cm. (2½ inches), the upper end of the incision reaching to the root of the penis. The sheath of the spermatic cord is incised and the venous bundle is completely isolated from the spermatic plexus from the inguinal ring to near the testicle. Now two strong catgut ligatures are applied in the middle of the venous bundle about 1 cm. distant from each other and the bundle cut through between the ligatures. The peripheral stump is then brought up and sutured to the external pillar of the external inguinal ring. The central stump is drawn down and sutured to the base of the peripheral stump. The two stumps lie thus side by side and are besides firmly held together by two further sutures. If there are very much enlarged veins in the other bundles of the spermatic plexus they are isolated in their full length, tied above and below and excised.

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Med.

WHOOPING-COUGH

A New Treatment of Whooping-cough. (Sobre un nuevo tratamiento de la coqueluche.) Dr. C. Ponce. Semana medica, Buenos Aires. No. 24, 607-612.

During a recent epidemic of whooping-cough in Buenos Aires Dr. Julio Lemos requested the author to try in his practice a sero-bacterine against whooping-cough which Lemos had worked out in his laboratory. The serum proved a success in the first few cases in which it was used. It was hypodermically injected in 75 cases in all; of these 17 cases were cured within 24 to 48 hours. Thirty-six cases required from 2 to 5 injections for a complete recovery. The remainder of the cases were greatly relieved but not completely cured. The serum is injected subcutaneously, the dose being 1 c. c. without regard to the age of the patient.

Med.

WOUNDS

Note on a New Method of Disinfecting Wounds by Antiseptic Air Currents. (Note sur un nouveau procédé de désinfection des plaies par les courants gazeux, antiseptiques.) Dr. Le Faguays. Paris chirurg., Paris, No. 6, 390-393.

The method consists in passing a continuous current of air charged with ether to which volatile antiseptics, as carbolic acid, camphor, or essence of geranium, are added, on the wound. A small bottle with two tubules, one of which reaches to the bottom, contains the air with the ether and volatile antiseptic. The upper end of the longer tube is connected by means of a rubber tube with a Nelaton catheter whose end reaches to the deepest part of the wound. The shorter tube is connected with an air container holding about 20 liters. The air is under pressure of about 2 or 3 kilos, which is suf-

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